

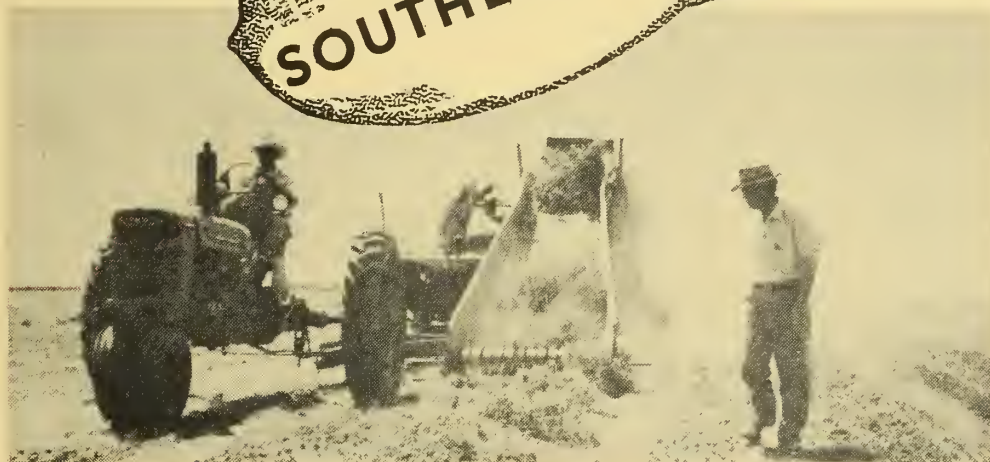
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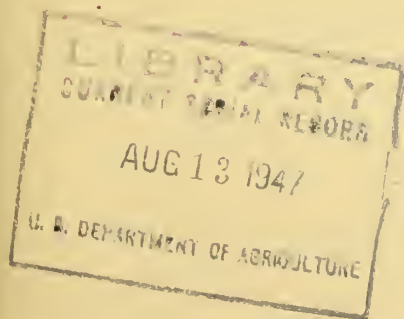


UNITED STATES DEPARTMENT OF AGRICULTURE  
BUREAU OF AGRICULTURAL ECONOMICS

# PEANUTS IN SOUTHERN AGRICULTURE



BAC



WASHINGTON, D. C.  
MAY 1947

# PEANUTS IN SOUTHERN AGRICULTURE

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## ACKNOWLEDGMENTS

William F. Lagrone, Troy Mullins, and Leo Fenske assisted in the field work and analysis of the data in this report. James C. Downing, George Townsend, and Jay Atkinson helped in the general analysis. E. L. Langsford gave guidance and criticisms throughout. Thanks are due to agronomists and agricultural economists of southern Experiment Stations and members of the Departments of Agricultural Economics of southern colleges for criticism and suggestions, and to staff members of the Bureau of Plant Industry, Soils and Agricultural Engineering for help and suggestions concerning soil adaptations and production practices.

By K. L. Bachman, G. B. Crowe, and K. V. Goodman 1/

DEVELOPMENT OF PEANUT PRODUCTION IN THE UNITED STATES

The Early Industry 2/

Before the Civil War the cultivation of peanuts in this country was confined to a small part of eastern Virginia. During the war almost every army in the field occupied, at one time or another, that very part of Virginia. When the armies disbanded, the soldiers carried a liking for peanuts to their far-scattered homes and the possibilities for sale increased correspondingly. Between 1865 and 1870, the peanut crop increased annually from 200 to 300 percent. By 1868, 300,000 bushels were grown in Virginia. Eleven years later, commercial estimates placed the production for the country at 1,725,000 bushels.

Hand work in cleaning and preparing the peanuts for market proved to be impracticable on a large scale, and until improved machinery for picking, cleaning, and shelling was invented, the peanut industry was restricted. The commercial development of the industry may be said to have begun with the erection of modern cleaning plants.

A factory for cleaning peanuts was installed in 1876 in New York City, the leading market for peanuts at that time, but it was soon found that the logical place for such a plant was in the area of production. One was soon established in Norfolk, Virginia. Peanut production extended quickly to other States and peanut factories mushroomed throughout the South.

The most rapid growth in production came in the Cotton Belt, notably in Alabama, Georgia, Florida, and Texas. The swift advance of the boll weevil from Texas eastward, with its ruinous effect on the yield of cotton in many large areas, pushed the farmers toward other crops. As peanuts promised a market - either directly at shelling or crushing mills, or indirectly at pork-packing plants, a wave of peanut growing soon swept over the Southern States.

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1/ Bachman, K. L., and Crowe, G. B., Agricultural Economists, Bureau of Agricultural Economics, U. S. Dept. of Agr.; Goodman, K. V., Soil Scientist, Bureau of Plant Industry, Soils and Agricultural Engineering.

2/ For a more detailed description of the early industry see U. S. Dept. of Agr. Misc. Pub. 416, "Marketing Peanuts and Peanut Products," by Harold J. Clay, 1941.

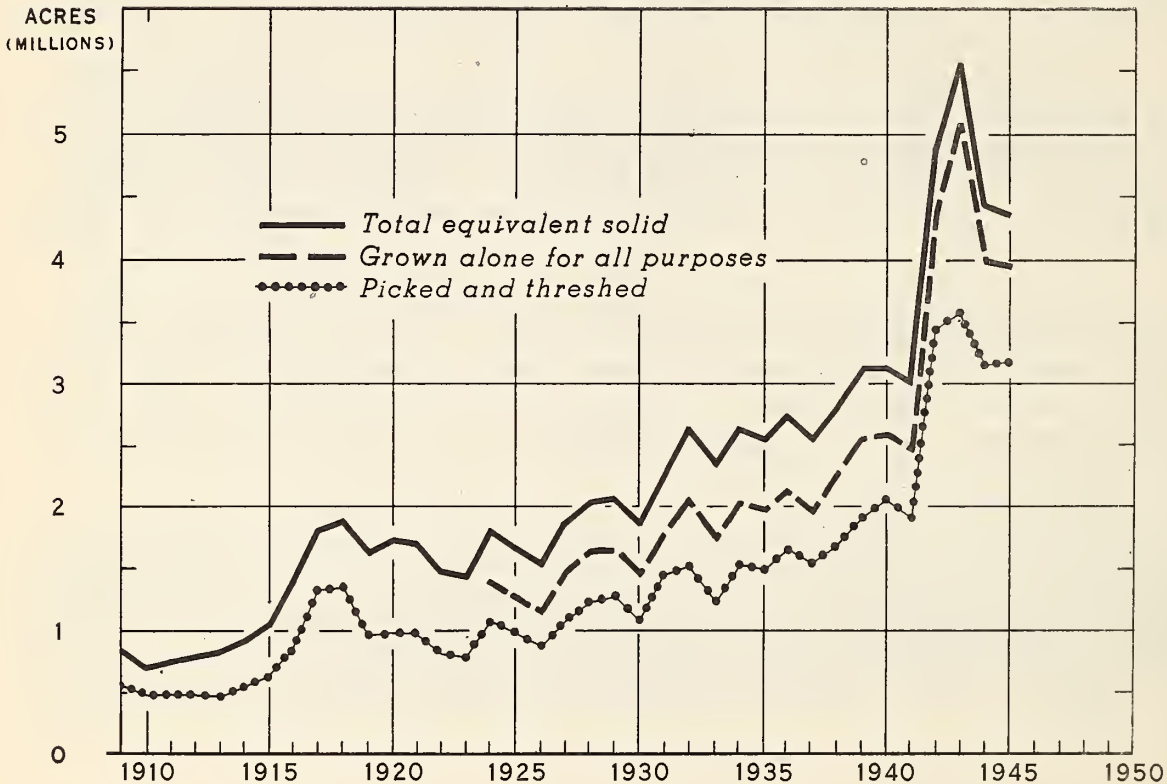
Acreage, Yield, and Production, 1909-45

**Acreage.**- The total equivalent solid acreage  $\frac{3}{4}$  of peanuts in this country grew approximately seven times its size between 1909 and 1943 (fig. 1). After reaching the all-time high of 5,565 thousand acres in 1943, the acreage decreased in 1944 and was slightly lower in 1945. Before that, the trend had been gradually but continuously upward during the entire period except for the two war periods when acreages expanded sharply.

The trend in the acreage of peanuts grown alone for all purposes is strikingly similar. From 1,394 thousand acres in 1924 the crop increased to 5,094 thousand acres in 1943 and dropped to 3,958 thousand acres in 1945 (fig. 1).

The acreage of peanuts picked and threshed is of primary importance from the standpoint of commercial production, since it is from this acreage that nuts for food and oil are obtained. It expanded from 537 thousand acres in 1909 to 3,595 thousand acres in 1943, increasing more than 6 times. There was a decline in 1944 and a slight increase in 1945.

PEANUT ACREAGE IN THE UNITED STATES, 1909-45



$\frac{3}{4}$  Acreage grown alone plus one-half the interplanted acreage.

The three sets of acreage figures follow a similar trend and they reacted alike with respect to both wars.

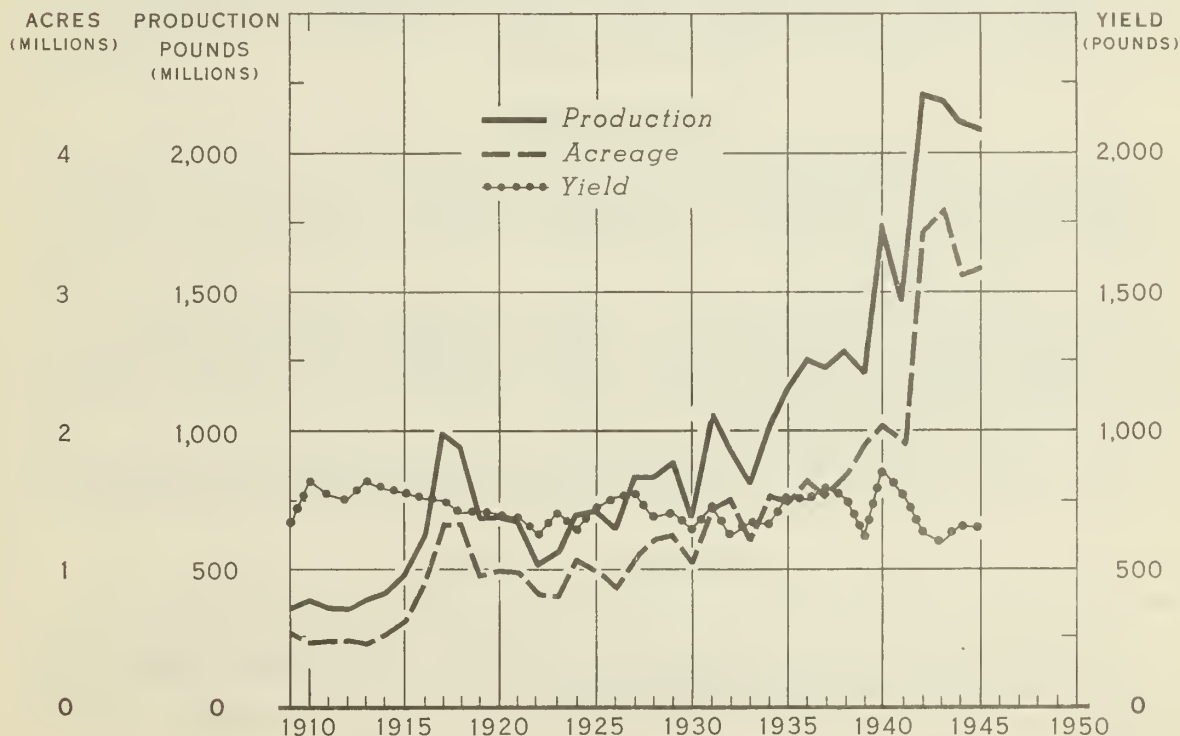
Yield.- The average yield of peanuts in the United States fell during both wars (fig. 2). This decline was due primarily to the relatively greater acreage expansion in the lower yielding areas of the West and the influence of new and inexperienced growers. Except during war periods, the yields showed little tendency to go either up or down. It might be well to point out here that the trend in yields of other crops has been slightly upward.

Production.- Peanuts picked and threshed rose from 354,605 thousand pounds in 1909 to a record high of 2,211,535 thousand pounds in 1942. This represents an increase of over 6 times. There has been a slight decrease each year since 1942. Production increases are not absolutely proportionate to acreage increases because yields are likely to decline during periods of pronounced expansion.

### Types and Varieties

Three separate types of peanuts are recognized in the commercial channels of trade - the Virginia type, the Spanish, and the Runner.

PEANUTS PICKED AND THRESHED, ACREAGE, YIELD, AND PRODUCTION IN THE UNITED STATES, 1909-45



Several varieties are included in the Virginia type, but all lose their identity as they reach the cleaning mill. They become known merely as Virginias. All are large podded and the kernels are covered with a pinkish skin. The two leading varieties are the Virginia Bunch and the Jumbo.

In southeastern Virginia and northeastern North Carolina, where most Virginias are grown, the Virginia Bunch and the Jumbo are sold separately. Most peanuts sold in the shell for roasting are of the Virginia type. 4/

The Spanish (or White Spanish) is the most widely distributed variety in the country. Georgia, Texas, Alabama, and Florida lead in its production. There are lesser acreages in the Piedmont section of Virginia and North Carolina, in Oklahoma, and in Arkansas. Some commercial production is found in South Carolina, Mississippi, Missouri, and Louisiana. The plant is upright in growth and is harvested easily as the pods are closely centered near the surface of the ground. Shelled Spanish peanuts are used by salters, peanut butter manufacturers, and candy makers. They have a higher oil content than either Runners or Virginias.

The Runner peanut is grown commercially in Alabama, Florida, and Georgia. The pod is of medium size but more nearly resembles the Spanish than the Virginia type pod. The Runner has a spreading rather than a bunch form of growth. In general, yields are somewhat higher than yields of the Spanish. The Runner was formerly grown primarily for "hogging-off" 5/ or for crushing, but increasing quantities are being used in the manufacture of peanut butter and peanut candy. The oil content is relatively higher than Virginia but not so high as Spanish.

#### Uses of Peanuts

Peanuts are a versatile crop in terms of utilization. They are used in three general ways - for food, for feeding livestock, especially hogs, and for oil.

Peanuts are a nutritious food. A pound of peanut butter contains more than three times as much food energy, more protein, more minerals, and more vitamins than a pound of round steak. Peanuts also compare favorably with other food products such as pork and dry beans (table 1).

In addition to their use in peanut butter, peanuts are used in the edible trade as salted and roasted nuts, in candy, and in bakery products.

When peanuts are crushed they produce a high-quality vegetable oil that can be used for both edible and industrial purposes. Its chief uses

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4/ Except that in 1938 and 1939, Valencias grown on a fair sized acreage in New Mexico were sold in the roasted state.

5/ "Hogging-off" is the practice of turning hogs into peanut fields to eat the nuts.

Table 1.- Nutritive value of one pound of selected foods as purchased <sup>1/</sup>

Item	Unit	Peanuts		Beans:		Beef		Pork
		:		common:		:		:
		Peanut:	Roasted:	or	lima	Rib	Round:	Fresh
		butter:	peanuts:	kidney:	2/	roast,	steak:	ham
		:	:	2/	:	rolled:	:	:
Refuse	Percent	0	28	0	0	0	11	14
Food energy	Calories	2,808	1,961	1,588	1,548	1,252	789	1,326
Protein	Grams	118.5	88.0	99.9	94.0	79.0	78.0	59.3
Fat	Grams	217.0	144.5	6.8	5.9	104	53	121
Carbohydrates	Grams	95.3	77.2	281.9	279.7	0	0	0
Calcium	Milligrams	336	242	672	301	45	44	35
Phosphorus	Milligrams	1,784	1,285	2,102	1,730	854	840	640
Iron	Milligrams	8.6	6.2	46.8	34.0	11.8	11.7	9.0
Vitamin A value	I.U.	0	0	0	0	0	0	0
Thiamin	Milligrams	.89	.96	2.71	2.71	.49	.48	3.75
Riboflavin	Milligrams	.72	.52	1.07	1.07	.62	.61	.73
Niacin	Milligrams	73.5	53.0	9.6	9.6	21.3	21.0	16.0
Ascorbic acid	Milligrams	0	0	8	8	0	0	0

<sup>1/</sup> Tables of Food Composition, Bureau of Human Nutrition and Home Economics, U. S. Dept. of Agr. Misc. Pub. 572, 1945.

<sup>2/</sup> Dry seed.

for food are in margarine, in shortening and in table oils. After the oil is taken off there remains the peanut meal - a high-protein feed for livestock.

When peanuts are to be used either as a direct food crop or for oil and meal they are harvested and separated from the vines. The vines are then commonly used as a roughage feed for livestock. When peanuts are used as feed for hogs they are grazed from the land; that is, when the nuts reach maturity the hogs are turned in the fields and allowed to root out the nuts and eat them. This practice offers the best opportunity to produce pork from home-grown feeds, in many areas. Peanuts for grazing avert the peak labor requirement at harvest and offer, in addition, certain definite advantages in soil conservation. Man labor needed for peanuts that are hogged is less than half the requirements when they are to be picked and threshed. The practice of hogging-off peanuts is confined mainly to Georgia, Florida and Alabama.

#### Trends in Consumption

The tremendous increase in the production of peanuts during the last 25 years raises the question of marketing. Figure 3 shows the supply and disposition of farmer's stock peanuts over this period and reflects trends in consumption to a certain extent.

Most of the harvested peanut crop is used for food. Roughly, three-fourths of the picked and threshed production is usually cleaned and shelled (fig. 3) and this part of the crop is used almost entirely for edible purposes. <sup>6/</sup> Occasionally, however, programs have been put into effect which diverted larger percentages of the crop to other uses. For instance, in 1940 only 57 percent of the harvested peanuts went to the edible trade.

Recently the peanut-butter trade has become the largest user of shelled peanuts. Table 2 shows the utilization of shelled peanuts for 1944 and 1945.

Table 2.- Utilization of shelled peanuts (raw basis) processed 1944-45

Percentage of total reported used in making <sup>1/</sup>	1944	1945
Candy	22.6	18.4
Salted peanuts	32.4	31.0
Peanut butter	42.3	48.3
Other	2.7	2.3

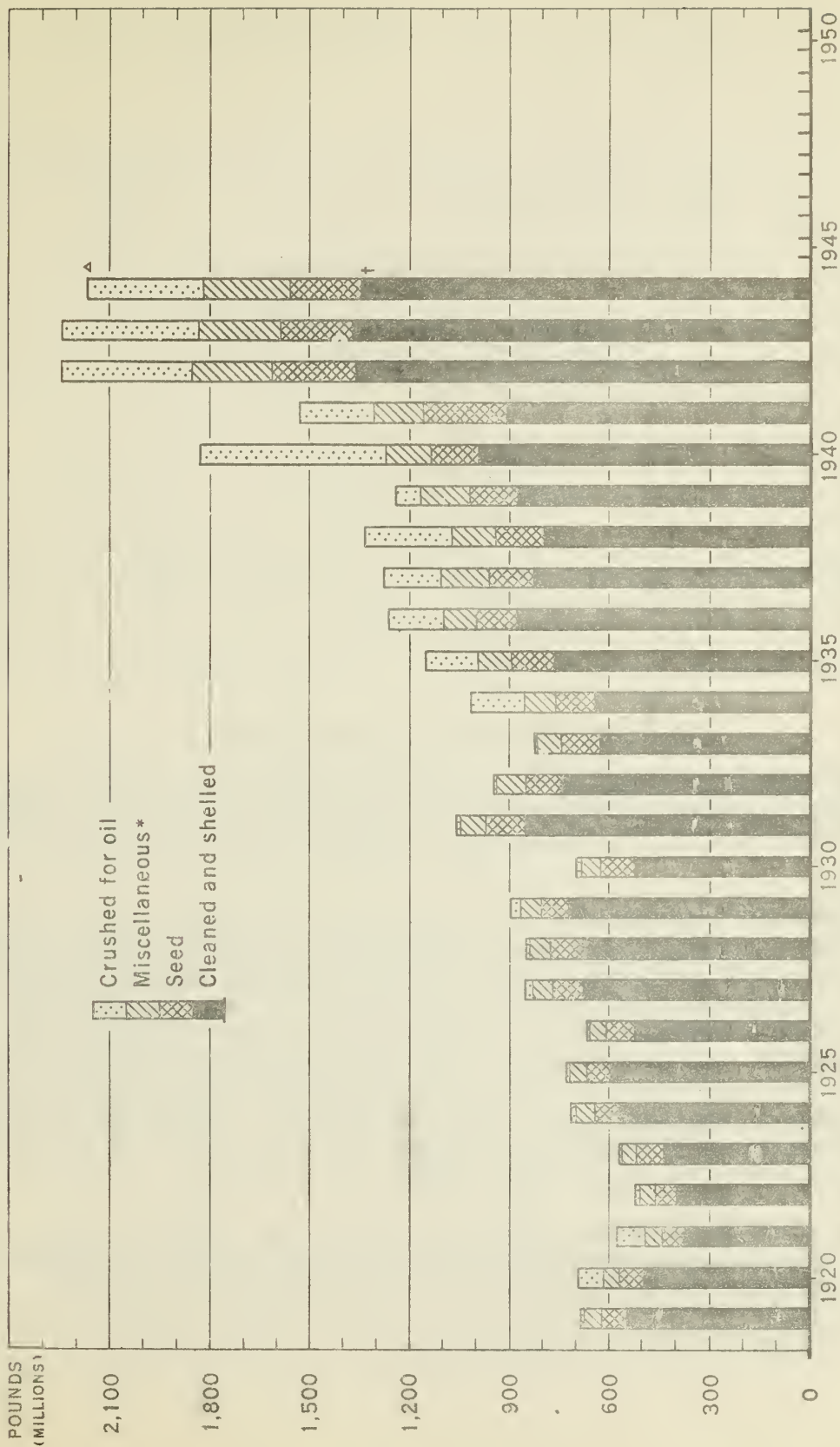
<sup>1/</sup> Relates to primary products produced. Peanut butter produced as such and going into candy is reported as peanut butter.

On the demand side peanuts (along with tobacco, milk, vegetables, and citrus fruits) have had an advantage over most of the staple agricultural commodities. The quantity cleaned and shelled per capita has been increasing for 25 years. A straight-line trend from 1920 to 1940, which removes the effect of year-to-year fluctuations, shows that the quantity cleaned and shelled per capita has been increasing at the rate of 0.16 pounds per capita annually. The years 1920 to 1940 were selected in order to minimize the effects of unusual conditions associated with the wars. The quantity has risen from 4.06 pounds at the beginning of the selected period to 7.47 pounds at the end (fig. 4). The actual quantity of nuts cleaned and shelled per capita rose to 10 pounds in 1942 and it remained at approximately that figure during the remaining war years.

From 1919 to 1934 a relatively insignificant portion of the picked and threshed crop was crushed for oil. But beginning with 1934, programs were instituted which encouraged the use of nuts for crushing and the quantity going into this use increased sharply, reaching an all-time peak of 558 million pounds in 1940 (fig. 3). The beginning of the war, along with curtailed oil imports and increased demands for oil, kept the crushing of nuts at a high level. During the war the quantity going into this use was a sizable portion of total production.

<sup>6/</sup> About 5 percent of the cleaned and shelled nuts are screened out as undesirable for food purposes and are crushed for oil.

# PEANUTS. FARMERS' STOCK: SUPPLY AND DISPOSITION. UNITED STATES, 1919-44



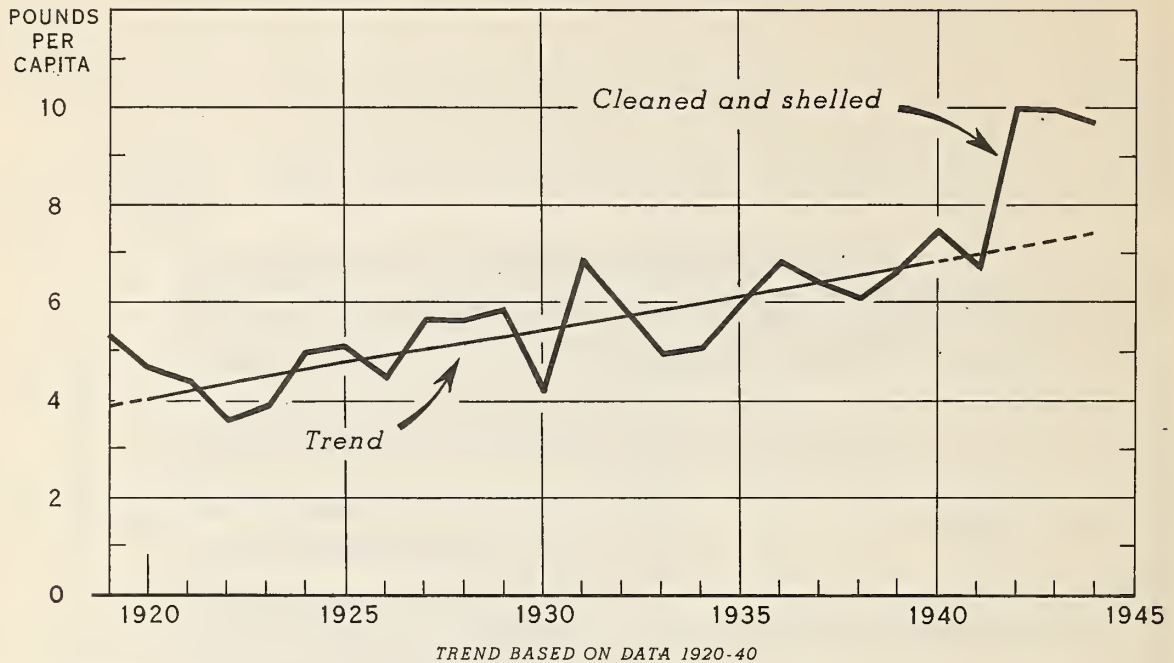
\* INCLUDES FED AND LOST, HOUSEHOLD USE, MISCELLANEOUS LOCAL USE, AND STOCK ON HAND (SINCE 1938)

Δ INCLUDES #2 SHELLS PEANUTS DIVERTED AND CRUSHED

† EXCLUDES #2 SHELLS PEANUTS DIVERTED AND CRUSHED (EQUIV. TO 229 MILLION LBS. IN 1944)

FIGURE 3

# PEANUTS, FARMERS' STOCK: QUANTITY CLEANED AND SHELLLED PER CAPITA, UNITED STATES, 1919-44



U. S. DEPARTMENT OF AGRICULTURE

FIGURE 4

NEG. 46336

BUREAU OF AGRICULTURAL ECONOMICS

## Peanut Programs and Policies, 1933-45

The peanut programs in the prewar period are noteworthy because of the influence they had on the supply of peanuts during that time and because somewhat similar programs may be adopted in the postwar period.

There have been three phases of the peanut programs. The first began in January 1934 and was made applicable to the 1933 crop. Millers entered into marketing agreements in which they agreed to pay minimum prices to growers of \$65 per ton for Southeastern and Virginia-North Carolina Spanish type, \$60 for Virginia type <sup>7/</sup> and for Southwestern Spanish, and \$55 for Runner type. These prices proved to be too high to be practicable. The millers stopped buying peanuts; but they continued to process them for farmers. The growers retained title to the peanuts and sold them at whatever prices they would bring. The marketing agreement was terminated in the fall of 1934 at the request of a majority of the millers. This ended the first phase.

The next phase of the program began with the 1934 crop. The measures adopted did not guarantee minimum prices, but were intended to obtain for farmers about the same prices as those established as a

<sup>7/</sup> Later changed to \$65 for Virginia type.

minimum for the previous year. Subsidies were offered to millers for diverting peanuts from the edible trade to be crushed for oil. In addition, steps were taken to adjust production in later years. Growers who signed a contract agreeing to adjust their 1935 acreage received two payments on their 1934 crop. They could obtain up to \$20 per ton for diverting up to 20 percent of their production to oil. In addition, a benefit payment of \$8 per ton of peanuts harvested in 1934, with a minimum payment of \$2 for each acre of the 1935 allotment, was to be paid for those who signed up and carried out agreements to adjust acreage in 1935. This payment, although based primarily on the 1934 crop, was conditioned upon carrying out practices in 1935, and of course was made only after information was available on the 1935 crop. In one sense this represented the peak of the adjustment program. Payments were three times as large as those made for adjustment (or conservation) in any other year, although the total subsidy was larger in other years.

What adjustment, then, was obtained in 1935 when the greatest effort was made? To begin with, the success of such a program depends upon a high degree of participation, for those not signing up will find it profitable to expand, rather than curtail. In this respect the program was rather fortunate. It included 78 percent of the commercial growers and approximately 90 percent of the acreage harvested in 1934. The farmers under contract reduced their acreage in 1935, but others expanded. The net effect was that total acreage remained the same in 1935 as in the previous year. An increase in yield per acre brought about a production increase of 14 percent above 1934.

Although the program did not reduce peanut production in 1935, it did support prices at \$60 to \$65 per ton for Virginia and Spanish type peanuts. This was slightly lower than the prices received for the 1934 crop. As in 1934, chief reliance for price support was placed upon subsidizing the crushing of peanuts for oil.

Following the Hoosac Mills decision invalidating the production-control and processing-tax provisions of the Agricultural Adjustment Act, in January 1936, and under the provisions of a new law (the Soil Conservation and Domestic Allotment Act, which was passed by Congress in February) the two principal means of supporting the price of peanuts were continued. As before, peanuts were diverted from edible uses to the crushers. Instead of paying farmers to reduce the acreage of peanuts grown, payment was made for diverting land from soil-depleting uses to soil-conserving or soil-building uses. Growers received \$25 per ton of the normal yield per acre up to 20 percent of the base acreage used for non-soil-depleting crops. For example, if a farmer had a base peanut acreage of 10 acres with a normal yield of 700 pounds, he could obtain \$8.75 per acre for hogging-off 2 of the 10 acres, for peanuts hogged-off are a soil-conserving crop. Payment was made for diverting 134,000 acres from peanuts to be harvested in 1936. But this was not sufficient to halt a continued increase in acreage harvested; the total increased 10 percent over 1935. As in the previous year, most of the increase occurred in the Southeast.

In general, two types of shifts had become profitable. Growers who had signed up had an incentive to increase yield, while those not in the program had an incentive to increase acreage. The fluctuation of yields from year to year makes it impossible to measure the effect of steps taken to increase yields over a period of a few years. During the operation of the program, however, yields increased more rapidly than during any other corresponding period. Part of this may be attributed to the diversion of eroded, low-yielding land to soil-conserving and soil-building crops and to the improved practices brought about directly by the program. But there was incentive for growers to adopt other measures to increase yields, which they probably did. The expansion in acreage by the growers not participating in the program was great enough, over a period of years, to more than nullify the reduction obtained on participating farms. Yet the stimulus of a supported price for peanuts was not necessarily the strongest influence toward a larger acreage of the crop.

In 1937, despite the prospect at planting time for continuance of effective price support, the acreage of peanuts was reduced 7 percent below that of 1936. The reduction coincided with a sharp expansion in cotton acreage. The two shifts were apparently related. The general decline in cotton acreage during the period following 1933 probably brought about pressure for an expansion in substitute cash crops, such as peanuts, and the lifting of controls on cotton caused many farmers to shift a part of this acreage back to cotton.

In 1937 the yield of peanuts was the highest obtained since 1913. Thus in spite of the reduction in acreage, production was down only 2 percent from 1936 and was higher than in any previous year.

During 1938 and 1939 the program was continued on much the same basis as before. Penalties were adopted for harvesting more than the base allotment. These penalties probably kept participating growers from expanding but non-participants brought about an expansion in total acreage. A low yield in 1939 reduced sharply the diversion of peanuts from edible purposes to the crushers. Before 1938 most of the expansion in peanut acreage had occurred in the Southeastern area, but in 1938 and 1939 large expansions were made in the Southwest.

In 1940, a slightly increased acreage and a record yield brought a production 50 percent higher than in any previous year. More than one-third of this record crop was crushed for oil at a cost to the Government of 8 million dollars, which was more than the total payments made to peanut growers since the beginning of the program.

The third phase of support programs followed the large crop in 1940. The growers voted for marketing quotas to be applied in 1941, 1942, and 1943, and nuts produced in excess of quotas were subject to penalty. Participation in the program was broadened. Whereas in 1940, allotments were made in only 6 leading States, in 1941 they were made in 14 States. In 1941, an acreage reduction of 7 percent from 1940 was

obtained and a production decline of 15 percent. Production was higher, however, than in any year before 1940. The control of peanut production virtually ended in 1941.

During the war producers were asked to increase greatly their acreage of peanuts for war needs. In 1942 the two-price system was continued, supporting the price of edible nuts at a price higher than was paid for nuts that were to be crushed for oil. Penalties for overplanting quotas were removed but all nuts produced in excess of existing quotas were to be sold at "oil prices." The two-price system was not satisfactory, and was abandoned after 1942. Support prices were increased further in 1943, 1944, and 1945, and the Commodity Credit Corporation became sole buyer of farmer's stock peanuts, under orders issued pursuant to the War Powers Act. Marketing quotas were suspended in 1943. Shelling and crushing mills and the regional cooperatives became agents of CCC to buy and dispose of the peanuts. The prices paid to growers in both years was a "blended price," arrived at by averaging the estimated quantity for shelling at a required percentage of the parity price and the estimated quantity for crushing at the value for oil and meal. Repurchases from CCC for shelling were at parity prices, and for crushing were at the oil-meal values. The revenue from shelling was applied to defraying part of the cost of subsidizing the crushing. This program also required disposal of low-grade peanuts for crushing in 1944 and 1945.

For the 1946 crop, prices were supported at 90 percent of the July 15, 1946 parity price. The supports were supplied through a system of loans and purchases. Acreage allotments and marketing quotas were not applied to peanuts produced in 1946.

Between 1933 and 1941, the acreage of peanuts harvested increased from 1.2 million to 1.9 million acres, or almost 60 percent. During this period production increased from 820 million to 1,750 million pounds - more than 100 percent. The general trend in yields may be illustrated by comparing 5-year averages near the beginning and near the end of the period. During the 5 years 1930-34, yields in the United States averaged 674 pounds per acre; 1937-41, the yields had climbed to 772 pounds per acre.

Thus during this period the program did not keep production at the levels existing before its induction. But of course this was not the aim of the program. A more important consideration is whether production expanded more rapidly than consumption for edible purposes. Because consumption figures from the 1933 crop are not available, consumption from the 1934 crop is compared with 1941 consumption. Production increased more than 100 percent; consumption increased less than 40 percent. But the program did support the price at a higher level than would have prevailed in its absence.

One important point in evaluating the postwar situation is the question of whether peanut production was stimulated or discouraged by

the support programs. Acreage of participants was controlled but the supported price was an incentive for non-participants to expand, despite penalties.

Because of the price-support program the wholesale and retail prices of peanuts were higher than they would have been otherwise. Without it, consumption would have expanded at least 40 percent. Any additional expansion that would have occurred would have depended upon the elasticity of the demand for peanuts, and the extent of the changes in prices. The wholesale price of cleaned and shelled peanuts may have been raised as much as 25 percent by the price-support measures of the program; this would cause some decrease in consumption. Price fluctuations were probably reduced, however, and the stability of prices would tend to encourage consumption, partly counteracting the effects of the higher average price.

#### Peanut Prices and Foreign Trade

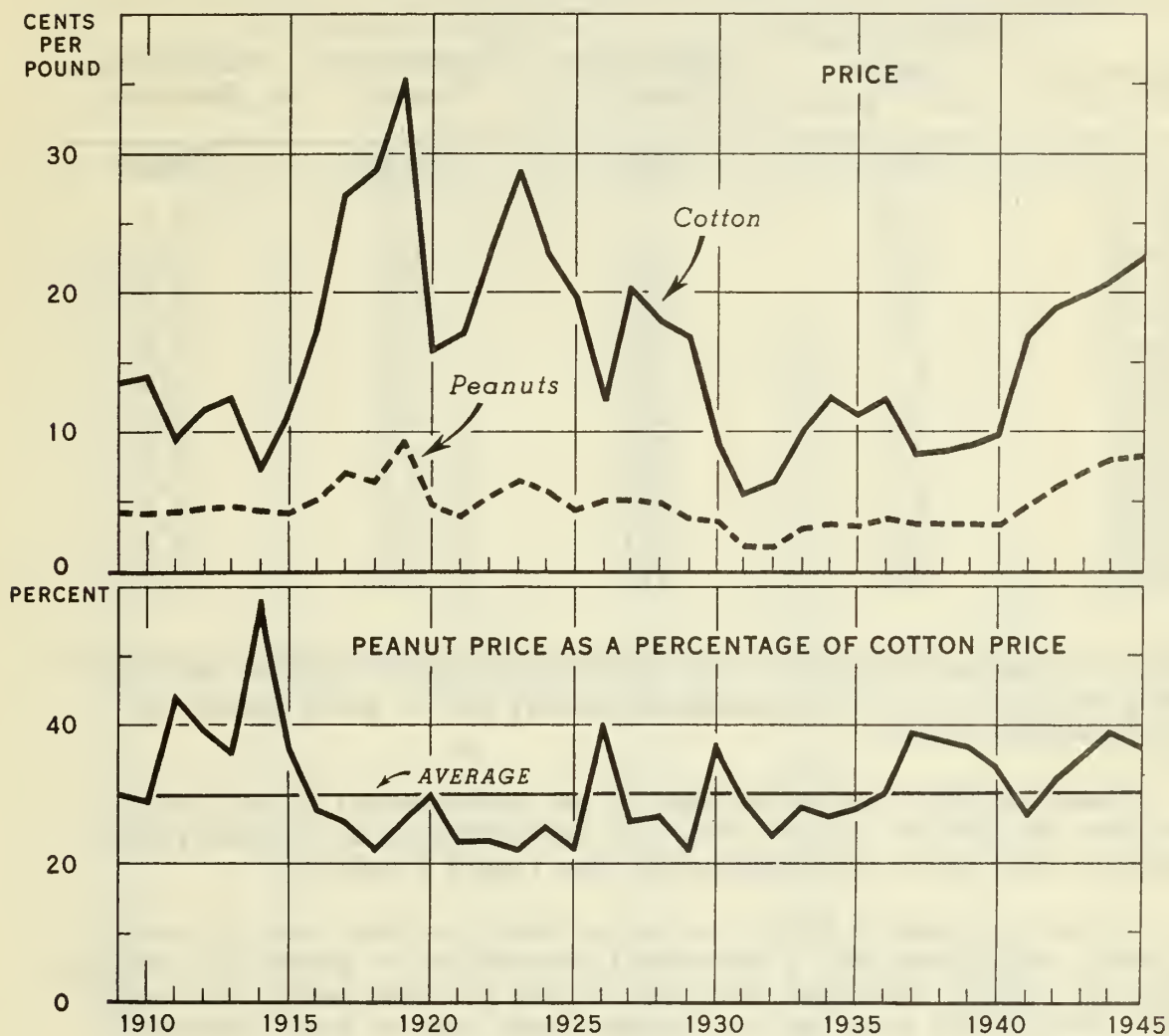
Prices received by farmers for peanuts have fluctuated greatly during the last 35 years. They have ranged from a low of 1.55 cents per pound in 1932 to a high of 9.3 cents per pound in 1919 (fig. 5). Prices during the 1934-40 period were relatively stable, ranging from 3.1 to 3.7 cents per pound. During World War II price increases were frequent and marked. Prices rose from 3.33 cents per pound in 1940 to 8.27 cents per pound in 1945. Similar increases were experienced during World War I. In contrast to the high prices during the war there were two years during the depression of the early 1930's when peanuts failed to bring as much as 2 cents per pound.

The relationship between the price of peanuts and the price of cotton is one of the most influential factors affecting peanut acreage. Figure 5 shows the price per pound of peanuts expressed as a percentage of the price per pound of cotton. Peanut prices, in terms of cotton prices, have varied widely during the last 37 years, ranging from a low of 22 percent to a high of 58 percent and averaging 30 percent. Since 1936, this relationship has been at the average of 30 percent or above for all years except 1941 when the price of cotton rose sharply. Of the 37 years shown, the ratio has been 30 or above for 18 years.

Prices also vary by types of mts. For the 12 years shown in table 3, Virginia Bunch peanuts averaged 3.88 cents per pound, South-eastern Spanish 3.52 cents, Southwestern Spanish 3.27 cents and South-eastern Runners 3.00 cents per pound. Generally speaking Southeastern Spanish mts bring a slightly higher price than those grown in the Southwest but Runner peanuts are almost invariably the lowest priced type.

Although the United States is not the leading producer of peanuts in the world, imports are negligible in comparison with domestic production (table 4). In addition to the normal effects of supply and price on imports, changes in tariff rates have had considerable influence.

AVERAGE PRICE PER POUND FOR PEANUTS AND COTTON, AND  
PEANUT PRICE AS A PERCENTAGE OF COTTON PRICE,  
UNITED STATES, 1909-45\*



\*SEASON AVERAGE PRICE PER POUND RECEIVED BY FARMERS FOR PEANUTS AND LINT COTTON

U. S. DEPARTMENT OF AGRICULTURE

FIGURE 5

NEG. 46337 BUREAU OF AGRICULTURAL ECONOMICS

Before 1930, imports fluctuated widely, reaching a high of 193 million pounds in 1919. Since 1930, when the tariff rate was raised to 7 cents a pound on shelled nuts, imports have been less than 10 million pounds per year, except in 1944. In that year the figure went up to 88 million pounds because some nuts were admitted duty free to help relieve the oil situation.

Before the days of the high tariff the nuts imported were chiefly special oriental nuts for the edible trade.

Table 3.- Peanuts (No. 1 farmer's stock): Average price per pound to growers f.o.b. country shipping point basis, 1931-32 to 1942-43

Crop year 1/	Virginia-type	Southwestern	Southwestern	Southwestern
	Bunch (Va. - N.C.)	Runners	Spanish	Spanish
	Cents	Cents	Cents	Cents
1931-32	1.5	.9	1.2	1.4
1932-33	1.6	1.1	1.6	1.3
1933-34	3.1	2.2	2.6	2.6
1934-35	3.6	3.3	3.9	3.3
1935-36	3.4	2.6	3.0	2.8
1936-37	4.1	3.1	3.6	3.7
1937-38	3.4	2.6	2.9	3.0
1938-39	3.4	2.5	3.0	2.9
1939-40	3.4	2.5	3.1	3.2
1940-41	4.6	2.9	3.4	3.1
1941-42	6.2	5.1	6.0	4.5
1942-43	8.2	7.2	8.0	7.4

1/ Crop year begins about Nov. 1 in the Virginia-North Carolina section; in early September in the southeastern States, and in early August in the Southwestern States.

Peanut exports have never been of any consequence; 23 million pounds were shipped out in 1944 but with the exception of 2 other years the exports have never even approached this figure (table 4).

Peanut oil imports have also varied widely within these 30 years. Immediately after World War I the annual importation of peanut oil reached 154 million pounds, but since that time it has not been nearly that much. Recently the imports have been an insignificant part of total domestic disappearance.

Exports of peanut oil are relatively insignificant. For 7½ years before the emergency tariff act of May 27, 1921, the duties on imported peanuts were 3/4 cents per pound for shelled and 3/8 cents per pound for unshelled nuts, and 6 cents per gallon for peanut oil. The rates since then have been as follows:

Date passed	Shelled peanuts per pound	Unshelled peanuts per pound	Peanut oil
May 27, 1921	3¢	3¢	26¢ per gallon
Sept. 21, 1922	4¢	3¢	4¢ per pound
Feb. 18, 1929	6¢	4½¢	4¢ per pound
June 18, 1930	7¢	4½¢	4¢ per pound

Table 4.- Exports and imports of peanuts and peanut oil, United States, 1912-44

Year	Peanut basis in shell 1/			Peanut oil crude basis 2/		
	Imports	Exports	Net imports	Imports	Exports	Net imports
			or exports			or exports
			3/			3/
	Mil. lbs.	Mil. lbs.	Mil. lbs.	Mil. lbs.	Mil. lbs.	Mil. lbs.
1909	35	4	30			
1910	23	5	16			
1911	17	6	10			
1912	22	7	15	7.6	---	7.6
1913	58	8	49	11.3	---	11.3
1914	29	6	21	7.4	---	7.3
1915	38	9	27	6.3	---	6.1
1916	49	22	28	15.7	---	15.5
1917	113	12	100	27.4	---	27.3
1918	31	14	17	68.5	---	68.4
1919	193	14	177	154.1	4.3	149.6
1920	69	13	55	95.1	1.4	93.7
1921	15	13	1	3.0	1.7	.9
1922	68	9	58	2.5	1.0	1.5
1923	76	4	70	8.0	.2	7.7
1924	140	3	133	15.4	5/	5.2
1925	54	4	45	3.0	---	1.3
1926	75	5	62	8.3	---	8.0
1927	96	5	86	2.8	---	1.9
1928	46	6	37	4.7	---	4.7
1929	15	4	10	3.2	---	3.1
1930	14	3	9	15.6	---	7.9
1931	2	3	- 3	14.9	---	1.5
1932	4/	5	- 5	1.5	---	.6
1933	1	1	- 1	1.3	---	1.3
1934	4/	4/	4/	2.7	---	2.7
1935	4/	4/	4/	80.7	---	80.7
1936	2	4/	2	49.0	---	49.0
1937	3	1	3	53.3	---	53.3
1938	8	1	8	15.6	---	15.6
1939	9	1	8	3.8	.3	3.5
1940	6	1	6	3.1	2.9	.3
1941	1	6	- 5	4.8	8.7	- 3.8
1942	4	3	1	.4	.7	- .3
1943	2	22	- 21	5/	.8	- .8
1944	88	23	65	5/	-.2	-.2

1/ Year beginning July 1.

2/ Calendar-year basis.

3/ Failure of net exports to reflect the differences between imports and exports is due to re-exports.

4/ Less than 500,000 pounds.

5/ Less than 50,000 pounds.

## Wartime Changes and Regional Trends

The trend in peanut acreage for 35 years has been gradually upward and during the two war periods acreages rose sharply. There was an increased need for edible nuts, along with a curtailment of oil imports. A pressing demand situation for peanuts developed.

The expansion of peanuts during World War II was greater than the expansion of the first World War, although the percentage increase was smaller. Between 1910-14 and the peak-of-the-war expansion in 1917-18, the total equivalent solid acreage of peanuts in the United States increased from 800,000 to 1,848,000 acres, or about 130 percent. In 1935-39 this acreage of peanuts in the United States was 2,747,000, which was 45 percent above the 1918 peak. The acreage of peanuts expanded to 4,799,000 in 1942-45. This World War II peak was six times the 1910-14 acreage,  $2\frac{1}{2}$  times the 1917-18 acreage, and 75 percent larger than the 1935-39 acreage.

Primary emphasis has been placed upon expansion of acreage of peanuts picked and threshed. The expansion of acres harvested for nuts in World War II was relatively greater than the increase in total equivalent solid acreage - 101 percent as compared to 75 percent (table 5). The expansion in acreage harvested, however, was not at the expense of acreage hogged-off. With a favorable price for hogs and with less available labor, the acreage hogged-off increased 19 percent. This was the same general pattern as developed in World War I. The percentage of the total acreage that was picked and threshed increased from 60 to 71 percent between 1910-14 and 1917-18, while between 1935-39 and 1942-45 the harvested acreage increased from 60 percent to 70 percent of the total. During both of the wartime expansions, average yields of peanuts in the United States have declined. In the first World War, yields dropped from 796 to 733 pounds per acre between 1910-14 and 1917-18. In the 1935-39 period yields averaged 746 pounds, which was 6 percent below the 1910-14 level but slightly above the 1917-18 yields. During the current wartime expansion yields again dropped - this time by more than 100 pounds. These declines in yield were primarily due to the relatively large increases in acreage in the lower yielding areas of the Belt. The significance of the changes in yields and production turns upon the differences between the principal peanut areas.

### Geography of Production

Although some peanuts are grown from Virginia to Texas, there are three distinct regions in which most of the production is concentrated. These are (1) the Virginia-North Carolina Region; (2) the Georgia-Alabama-Florida Region; (3) the Oklahoma-Texas Region. For purposes of discussion other peanut-producing States are grouped together and referred to as "other States." <sup>8/</sup> Although peanuts are widely grown within these broad regions, there are highly concentrated areas of production within each.

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<sup>8/</sup> Except for Tennessee; the small acreage in this State is included in the Virginia-North Carolina Region.

Table 5.- Wartime changes in peanut acreage, yield, and production in the United States and selected areas <sup>1/</sup>

Year	Total U. S.	Va.-N.C. area	Ga.-Fla. and Ala.	Okla. and Texas	Other States
<u>Acreage (1,000 acres)</u>					
1910-14 av.	481	296	117	46	22
1917-18 av.	1,320	301	730	246	43
Change	+ 839	+ 5	+ 613	+ 200	+ 21
Percent change:	+ 174.4	+ 1.7	+ 523.9	+ 434.8	+ 95.5
1935-39 av.	1,659	388	923	277	71
1942-45 av.	3,342	457	1,677	1,074	133
Change	+ 1,683	+ 69	+ 754	+ 797	+ 62
Percent change:	+ 101.4	+ 17.8	+ 81.7	+ 287.7	+ 87.3
<u>Yield (pounds)</u>					
1910-14 av.	796	834	745	717	705
1917-18 av.	733	974	707	528	669
Change	- 63	+ 140	- 38	- 189	- 36
Percent change:	- 7.9	+ 16.8	- 5.1	- 26.4	- 5.1
1935-39 av.	746	1,120	695	457	477
1942-45 av.	643	1,093	669	434	488
Change	- 103	- 27	- 26	- 23	+ 11
Percent change:	- 13.8	- 2.4	- 3.7	- 5.0	+ 2.3
<u>Production (1,000 lbs.)</u>					
1910-14 av.	383,075	247,015	87,770	32,935	15,355
1917-18 av.	967,340	292,412	514,500	131,600	28,828
Change	+ 584,265	+ 45,397	+ 426,730	+ 98,665	+ 13,473
Percent change:	+ 152.5	+ 18.4	+ 486.2	+ 299.6	+ 87.7
1935-39 av.	1,229,204	434,134	636,502	124,790	33,778
1942-45 av.	2,146,668	498,658	1,122,258	462,641	63,111
Change	+ 917,464	+ 64,524	+ 485,756	+ 337,851	+ 29,333
Percent change:	+ 74.6	+ 14.9	+ 76.3	+ 270.7	+ 86.8

<sup>1/</sup> Picked and threshed basis.

Production in the Virginia-North Carolina Region is largely concentrated in a small section in Southeastern Virginia and Northeastern North Carolina.

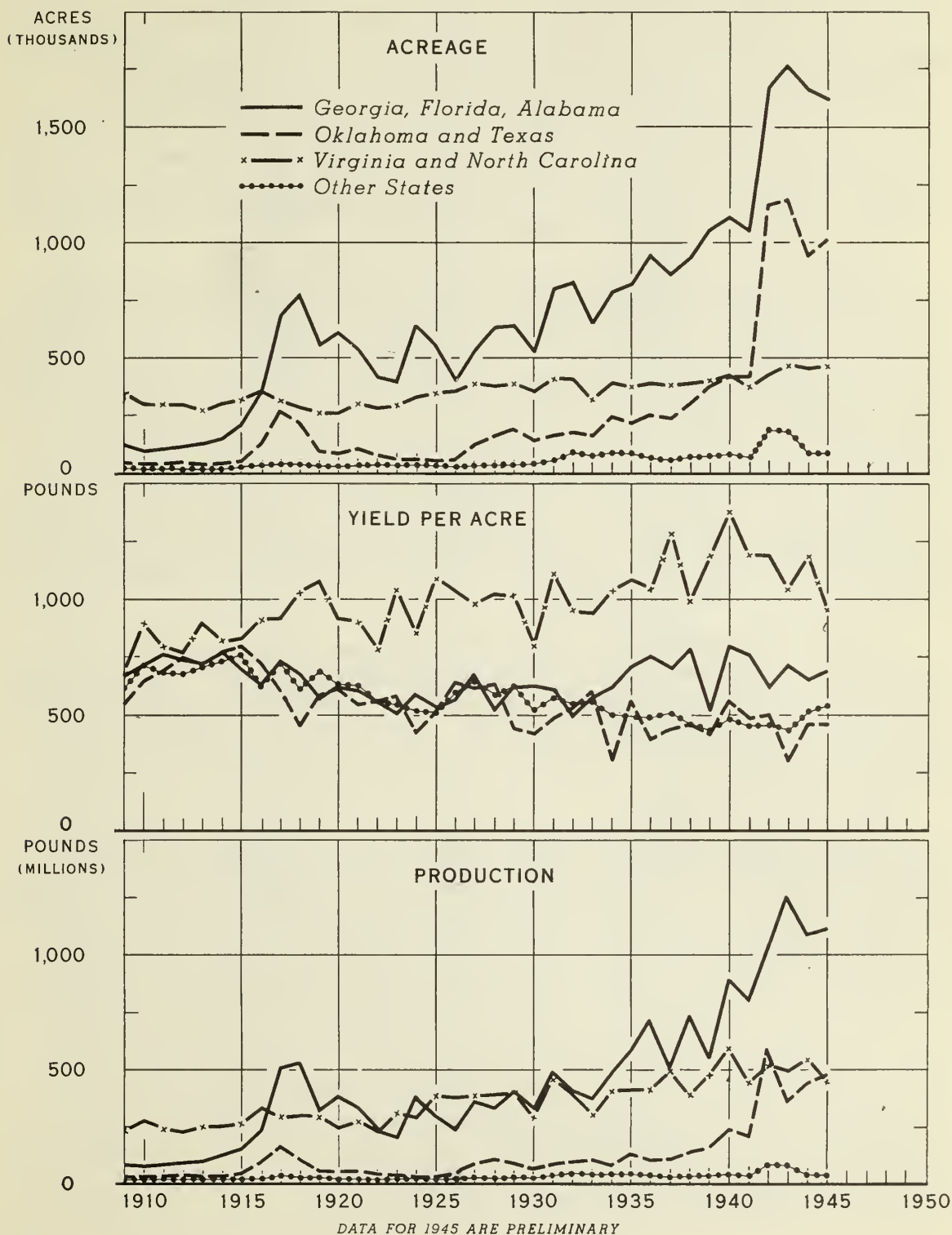
In the Georgia-Alabama-Florida Region the most intensive area of picked and threshed production includes the Coastal Plain of southwestern Georgia and southeastern Alabama. Considerable acreages of peanuts are harvested for nuts in southeastern Georgia and northern Florida. In addition to the acreage harvested for nuts, approximately 800,000 to 900,000 acres of peanuts are hogged-off annually in this region. The practice of grazing peanuts with hogs is of especial importance in northern Florida, southeastern Georgia, and parts of Alabama.

Concentrated areas of production in the Texas-Oklahoma Region are found in southern and north-central Texas and south-central Oklahoma. Other States are relatively unimportant, producing less than 3 percent of the total peanut crop.

Virginia-North Carolina Region.- Before World War I, more than one-third of the total acreage of peanuts grown alone and almost two-thirds of the acreage harvested for nuts was grown in the Virginia-Carolina Region (fig. 6). The proportion of the crop grown in this region has declined to less than one-fourth of the United States total but the absolute acreage has increased, and the yields have steadily improved. In the rather limited area in which this production is concentrated almost all of the farmers grow peanuts generally in a 3-year rotation with corn and cotton or soybeans. Soil surveys do not show the soil to be basically superior to other peanut areas in the Coastal Plain, but crop yields average from 50 to 100 percent higher. This is true in spite of the fact that a very high proportion of the cropland is in intertilled, soil-depleting crops that are harvested for sale. In addition, the acreage of peanuts during the last few years has been in excess of one-third of the cropland that is suitable for peanut production, which level is considered the upper limit on the proportion of the cropland in peanuts that is consistent with soil conservation. In spite of all this the yields of all crops have been increasing more rapidly than yields in other areas. Peanut yields averaged 834 pounds in 1910-14, 974 pounds in 1917-18, 1,120 pounds in 1935-39, and 1,093 pounds in 1942-43. Heavier fertilization and generally improved management practices have been influential in bringing the increases.

The Georgia-Alabama-Florida Region.- The largest peanut-producing area is the Georgia-Alabama-Florida Region. Approximately one-half of the United States total picked and threshed production is located in this region. Several factors have contributed to the important position of these three States in the beltwide picture. Among them are relatively good yields, an abundance of adapted land, the risk of insect damage in cotton production, and the favorable position of peanuts as an alternative enterprise.

# PEANUTS PICKED AND THRESHED: ACREAGE, YIELD, AND PRODUCTION, BY AREAS, UNITED STATES, 1909-45



Before World War I, the acreage picked and threshed was less than one-half as large as in the Virginia-North Carolina Region, but during the war the acreage expanded to more than double the Virginia-North Carolina acreage, and has remained larger. More contraction in acreage following World War I took place in this Region than in Virginia-North Carolina. For the decade following that war the Georgia-Alabama-Florida acreage remained below the wartime peak whereas the Virginia-North Carolina acreage climbed above the war level; but between 1930 and 1940 the Georgia-Alabama-Florida Region almost doubled, while the Virginia-North Carolina acreage rose less than 20 percent. The expansion during World War II was almost the same as that between 1930 and 1940 - acreage almost doubled in the Georgia-Alabama-Florida Region and increased less than 20 percent in Virginia-North Carolina.

Yields in the Georgia-Alabama-Florida Region followed a downward trend during and immediately after World War I. From an average of 745 pounds in 1910-14, yields fell to 707 pounds in 1917-18, and to 576 pounds in the 5-year period, 1920-24. There was practically no increase during the two succeeding 5-year periods. Beginning about 1934, however, they have improved. Before 1930, yields in this area had been generally no higher than in Oklahoma-Texas. Since then, they have been higher each year and the increase will probably continue. In the 5-years 1930-34, yields averaged 584 pounds; during the following 5 years they increased to 695 pounds. During the last 5 years yields have been above 700 pounds in each year except 1942. They are now 50 percent above the yields in Oklahoma-Texas, and in the newer areas of the Southeast, whereas 10 years previously they were no larger.

The long-time decline in yields that was taking place up to about 1933 has usually been attributed to a gradual depletion in the fertility of the soil. The improvement in yields that followed coincided with the extension of soil-improving practices. The control of peanut acreage and heavier applications of fertilizer have also contributed to the increase in yields.

Almost all of the peanuts hogged-off in the United States are in the Georgia-Alabama-Florida Region. The acreage <sup>9/</sup> devoted to this purpose has shown a steady trend upward for 35 years (table 6). Although this acreage has risen steadily from around 200 thousand acres in 1909 to over a million during the last war, the pressure of peanuts for use in the edible trade has caused hogged-off acreages to be a smaller proportion of the total for the war years. During both wartime expansions the percentage of the acreage that was hogged-off decreased, although the total acreage hogged-off increased in both wars. In the expansion

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<sup>9/</sup> No statistics are available on the actual acreage "hogged-off." It is generally believed that the difference between the total equivalent solid acreage and the acreage picked and threshed is mostly hogged in the Southeastern States. For purposes of this study this difference in acreage is referred to as acreage "hogged-off."

Table 6.- Peanuts: Acreage hogged-off, Southeastern States, 1909-45 <sup>1/</sup>

Year	Total equivalent solid	Picked and threshed	Hogged-off	Percent hogged-off is of S. E. total equivalent solid
	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>1,000 acres</u>	<u>Percent</u>
1909	333	126	207	62
1910	293	103	190	65
1911	328	109	219	67
1912	378	119	259	69
1913	443	130	313	71
1914	498	156	342	69
1915	609	217	392	64
1916	809	366	443	55
1917	1,087	693	394	36
1918	1,246	782	464	37
1919	1,130	562	568	50
1920	1,226	615	611	50
1921	1,130	545	585	52
1922	972	424	548	56
1923	928	408	520	56
1924	1,273	660	613	48
1925	1,144	564	580	51
1926	973	413	560	58
1927	1,149	543	606	53
1928	1,279	640	639	50
1929	1,241	649	592	48
1930	1,196	539	657	55
1931	1,485	815	670	45
1932	1,742	845	897	51
1933	1,563	662	901	58
1934	1,632	799	833	51
1935	1,637	834	803	49
1936	1,826	959	867	47
1937	1,704	872	832	49
1938	1,864	946	918	49
1939	2,055	1,072	983	48
1940	2,024	1,133	891	44
1941	1,982	1,069	913	46
1942	2,849	1,720	1,129	40
1943	2,976	1,834	1,142	38
1944	2,699	1,700	999	37
1945	2,597	1,658	939	36

<sup>1/</sup> Includes Ga., Fla., Ala., and S. C., and is the difference between equivalent solid and picked and threshed acreages.

of peanuts that took place between the two wars in this area, the acreage hogged-off has shown about the same relative increase as the acreage picked and threshed. The acreage used primarily for hogging-off in the Georgia-Alabama-Florida Region was 265,000 in the 1910-14 period, 429,000 in 1917-18, then 881,000 in the 1935-39 period, and 1,052,000 in 1942-45.

The Oklahoma-Texas Region.- Before World War I, peanut production was not important in the Oklahoma-Texas Region. In 1910-14 only 46,000 acres were picked and threshed - less than one-sixth of the Virginia-North Carolina acreage. In 1917-18, however, 246,000 acres were picked and threshed, which was more than four-fifths of the Virginia-North Carolina acreage. The expansion in the Oklahoma-Texas Region was at about the same rate as in the Georgia-Alabama-Florida Region, although the Oklahoma-Texas acreage was only one-third as large, both in the prewar period and at the peak expansion during the war. Peanut acreage in the Southwest decreased after World War I. By 1920 the acreage picked and threshed had fallen to less than one-third of the peak reached in 1917. In the 5 years 1920-24 the average acreage was still lower- about double the 1910-14 level but only about one-third of the 1917-18 level. The percentage of the total United States acreage that was grown in Oklahoma-Texas was lower in the 5 years following the first World War than in the prewar period. This failure of peanuts to obtain a firm foothold in the cropping pattern in Texas, which had almost all of the peanuts grown in the Southwest during these years, was probably due to temporary difficulties rather than to any basic unsuitability of the soil or climate, for during the following two decades there was a considerable expansion of peanuts in this region. Yields were not good in 1917 and were worse in 1918. Possibly some of the reduction was due to inexperience of some of the growers and the inclusion of areas of relatively low productivity. But the greatest acreage increase was in 1916 and 1917. There was actually a reduction in acreage in 1918 when yields were lowest. The principal explanation is probably found in the weather. In 1917 the summer rainfall in Texas was 39 percent of normal and in 1918, 64 percent of normal. The yield of cotton fell more than the yield of peanuts. In these 2 years the cotton yield was only 50 percent and 63 percent of the 1910-14 average, while peanut yields on the same basis were 83 percent and 62 percent of normal.

From the very low peanut acreage in Oklahoma-Texas following World War I a gradual but persistent expansion began in the late twenties. In 1920-24, 80,000 acres were picked and threshed, in 1925-29, 122,000 acres; in 1930-34, 179,000 acres; and in 1935-39, 277,000 acres. In 1940 and 1941, the acreage was more than 400,000. Then during the second World War more than a million acres were grown every year except one.

The decline in yields in the Oklahoma-Texas Region during World War I has been mentioned as partly due to weather. Following that war they were slightly higher but they remained below prewar levels. Again in the thirties yields fell by almost 20 percent. In 1910-14, peanuts averaged 717 pounds per acre, in 1920-29 they averaged 556 pounds, in

1930-39 they were 462 pounds, which was 36 percent below pre-World War I yields and 17 percent below the previous decade. This reduction in yield was due in part to expansion to lower yielding areas. In the 3 years of expanded acreage during World War II, 1942-45, peanuts averaged 434 pounds, or 5 percent below the 1935-39 level. The slight reduction was due primarily to the 1943 drought.

#### PHYSICAL CONDITIONS AND LIMITATIONS

Land and its attributes of soil, surface, and climate, constitute the physical factors that influence the kinds and quantities of agricultural production.

The climatic conditions of temperature and moisture partially determine the range of crops that may successfully be grown. These conditions vary widely throughout the Southern States, but their influence from one climatic zone to the other is manifested only gradually. Peanuts are successfully grown as far north as Virginia and as far west as the subhumid areas of Texas. (Limited acreages are also grown in New Mexico and California.) More sharp are changes in kinds of crops caused by differences in soil types and related features. Certain areas are better suited to peanuts, for example, than to other crops because of the relatively higher yields obtained, or the proportion of suitable soils. This is well illustrated by the distinct change from the intensive peanut production in the Georgia Coastal Plains to the negligible place of peanuts in the nearby Piedmont areas.

In each area the physical resources for peanuts are determined primarily from the soils, climate, and relief or topography. All of these are more or less reflected by the soil types within the areas because the soil type is in itself the result of a combination of "(1) climate, (2) vegetation, (3) relief, (4) rocks, and (5) age." <sup>10/</sup> Because of this, the basic units selected for the study of the land suitable for peanuts are the soil types; and their extent within the peanut-growing areas was determined from individual county soil surveys. All of the counties in which soil surveys have been made were not used in the study, but a sufficient number were selected to represent the type-of-farming areas in the peanut-growing regions. In addition, field investigations of the suitability of different soils were made in selected counties in each area. Joint physical and economic analysis of peanut practices, yields, and returns were made in selected areas on several individual farms.

Investigations were made to learn which soil types were used mostly for peanuts and the nature and extent of soils suitable for their production. From these investigations, it became apparent that approximately four groups of soil types producing high, moderately high, moderate, and low yields could be established. The yields for each

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<sup>10/</sup> Kellogg, C. E. "The Soils that Support Us", The Macmillan Company, 1941, p. 296.

group varied from area to area and region to region. The soil groups themselves were designated as excellent, A; good, B; fair, C; and poor or unsuitable, D. They are based primarily on the texture and depth of the surface soil layers, drainage, the character and depth of the subsoil layers, and such other characteristics as stoniness, gravelliness, steepness of slope, and the alkali content (amount of soluble salts).

### Soil Types Suitable for Peanuts

A great many soil types are suitable for peanuts but certain soil characteristics affect the growth or harvesting more than others. Peanuts will grow in nearly all parts of the South, but the range in suitability of the different soils for peanuts is very wide. On some soils good yields can be obtained without difficulty, but on others yields remain low despite much work and expense on the part of the farmer. Farmers frequently blame the weather for poor yields when in reality the difficulty is traceable to unsuitable soil. Soils that are stony, very gravelly, shallow (to bedrock), and wet (poorly drained) or very fine or heavy textured, are generally not used for peanuts. Neither are extremely acid, limy, or salty soils. When they are used, as they sometimes are when they occupy small areas intermingled with other soils in the same field, production is usually low. Deep sands, although they are sometimes used for the crop, are not well suited for peanuts. The characteristics having the greatest influence on the suitability of soils for peanuts are largely physical in nature, and are shown in the following diagram.

Fifteen major combinations of soil characteristics, represented by the 15 composite diagrams in figures 9, 10, and 11 are found in peanut fields on which at least 90 percent of the peanuts have been grown. The soils exhibiting these profiles have been grouped into the classes excellent, good, fair, and poor for peanuts, on the basis of estimated yields and general suitability for peanut production. These soil groups represent nearly 200 soil types on which peanuts have at some time been grown (appendix table 2).

### Soils Excellent for Peanut Production

The excellent soil types have good drainage and yellow, brown, gray, or red sandy loam, or fine sandy loam surface layers with friable sandy clay loam or sandy clay subsoils beginning 10 to 20 inches below the surface. The subsoil layers are also rather uniformly colored.

The subsoil usually is a fine sandy clay or sandy clay, but may be a clay loam. It should always be crumbly, easily worked by the fingers, and have a color that indicates free air movement in the soil. Bright and uniform red, yellow, brown, or combinations such as yellowish brown or reddish brown, are characteristic of well-aerated subsoils. The subsoil, as a rule, will extend to a depth of about 3 feet or more before further noticeable changes are found. Beyond this depth the subsoil may change color, be coarser or finer, or may be slightly damp, but such

characteristics at depths below 36 to 40 inches do not usually affect the quality of the land for peanuts.

Nearly all the excellent soil types are of considerable depth, even when underlain by rock, as profile diagram No. 2 (fig. 7) shows, and they generally are found on slopes favorable for tillage without danger of excessive erosion. Very little, if any, gravel or stones occur in the soil, and rock ledges never appear on the ground's surface. Examples of excellent soils are the Norfolk, Marlboro, Tifton, and Magnolia sandy or fine sandy loams (on slopes less than 10 percent) in the Coastal Plain; Duval, Teller, and Nacogdoches sandy or fine sandy loams in the Southwest.

### Soils Good for Peanut Production

A good soil for peanuts commonly differs from an excellent soil in that the surface layer has either a heavier or a lighter "feel" or texture, and is shallower or deeper. A shallow good soil usually has a surface depth of about 8 inches while a deep good soil has a depth of approximately 28 inches, but in the latter cases the texture is generally a sandy loam, fine sandy loam, or very fine sandy loam, as with excellent soils.

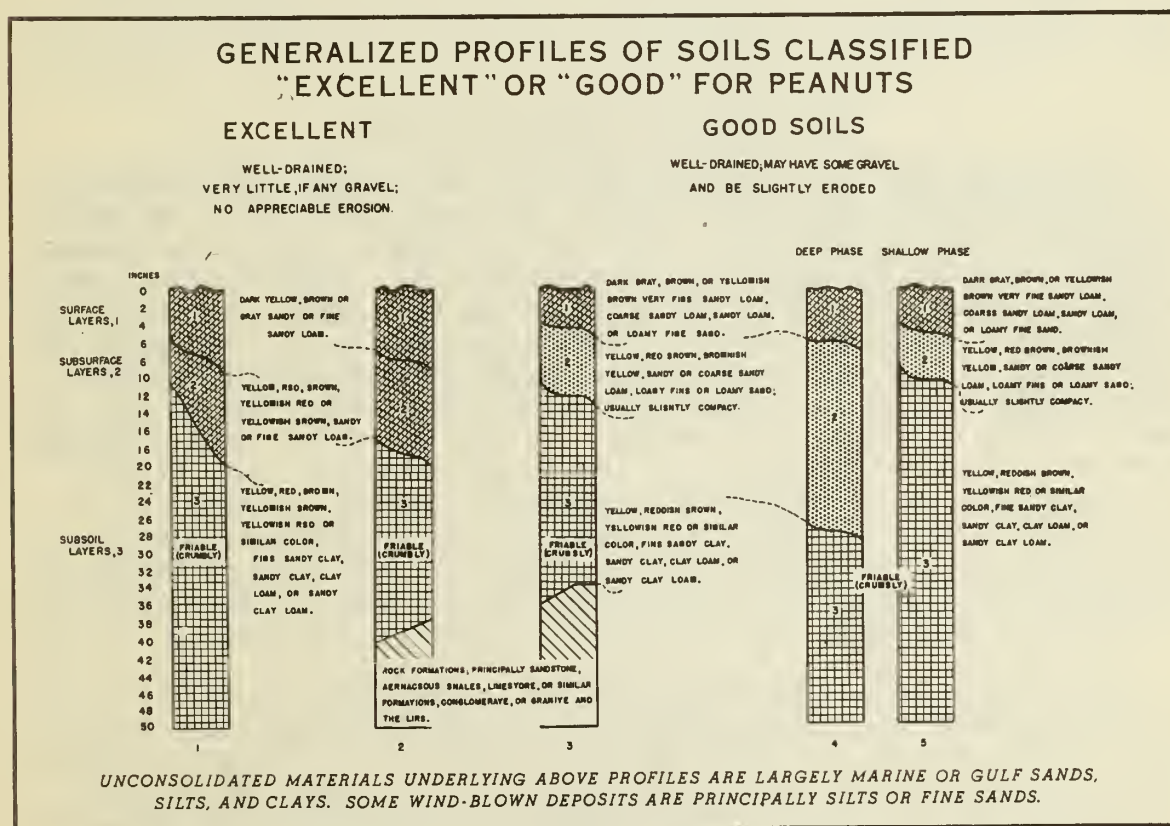


FIGURE 7

The subsoil in a good soil is also similar to that for an excellent soil, but the coloring may be not so bright. The coloring is generally uniform and does not usually change much above a depth of about 32 inches. Below this depth the subsoil may change in the ways described for excellent soils.

The good soil types, in general, are not greatly different from those considered as excellent, but will have some characteristics not quite so favorable. The surface layers may be thinner than would be required for an excellent soil; or the surface soil may be coarser, as in a coarse sandy loam.

Soils occurring over unconsolidated sands, clays, and other sediments of the Coastal Plain, having thin surface layers as the result of accelerated erosion, are represented by profile diagram No. 5 (fig 7). The deep phases of such excellent soil types, as Norfolk, Ruston, and Orangeburg sandy loams, are also included in the good group. Profile diagram No. 4 shows a deep phase and represents a great portion of the sandier (but by no means the sandiest) Coastal Plain soils. Soils in the hilly sections of Oklahoma and Arkansas and in the Piedmont Region, occurring over rock formations, normally have thinner surface layers than other good soils, and are represented by profile diagram No. 3. Examples of the good soils are: The deep phases of the Norfolk or Ruston sandy loam or fine sandy loam in the Coastal Plain; Cecil or Appling coarse sandy loam or moderately eroded phases of the Cecil or Appling sandy loam in the Piedmont; and Bowie, Webb, or Miles sandy loams in the Southwest.

#### Soils Fair for Peanut Production

The fair soil types are characterized by at least one condition definitely adverse to the best growth of the peanut crop or to the ease with which it can be harvested. Five major combinations of soil characteristics occur in the fair group of soils (fig.8). Possibly the leading adverse condition, in view of the areas of the soil types, is that of imperfect (but not poor) drainage (profile diagram No. 6). It occurs in a great many soils along drainage ways and in soils of the upland with predominantly flat relief. Imperfectly drained soils are not in all cases directly deleterious to peanuts. On some soils the moist condition of the soil profile (diagram No. 6) may favor weeds, root rot, blight, and vine growth, so as to reduce the amount or quality, or both, of the crop in the ground. In many places where artificial drainage has been installed, the weeds reduced and "rot" controlled, very good yields of peanuts have been obtained. To do this, however, entails extra expense and more work than where the fields are on excellent soil types.

Another adverse condition occurring in peanut fields is that of deep sandy subsurface layers. Many coarse sandy loams and loamy sands in the Coastal Plain are like this, and yields seem to be severely restricted unless considerably more fertilizer than is used elsewhere is applied, or side dressing of lime or calcium sulphate (land plaster) are made on the peanuts about peg-setting time. Profile diagram No. 7 shows the sandier soils on which peanuts have been grown.



Arkansas, and Alabama Highlands and in the Piedmont. It includes shallow, sandy, well-drained soils developed over rock ledges. In such types the ledges themselves may outcrop in places. Crops are never uniform on such fields and equipment is often broken if outcropping ledges are struck during cultivation.

Some soil types in the fair group have considerably more gravel or stones or are more eroded than those in the excellent and good groups.

Examples of the fair soils are well-drained deep loamy sands and coarse sandy loams of the Coastal Plain; most imperfectly drained soils of the Coastal Plain such as the Coxville or Dunbar series; moderately rolling or moderately eroded sandy soils in the Piedmont; and Katy, Kirvin, and Potter fine sandy loams in the sandy areas of the Southwest.

#### Poor Soil Types for Peanuts

Soils in this group are poor for peanuts because of characteristics that limit production or prevent proper cultivation of the land. Included are very sandy, very clayey, hilly to mountainous, wet or swampy, and rocky soils (fig. 9). If these soils are used for peanuts, yields will be very low.

In the Coastal Plain, all poorly drained and swampy soils like the Portsmouth, Myatt, Plummer, Bladen, and Johnston series, peat and muck; all excessively drained soils like Dunesand, Blanton, and Norfolk coarse sands; and fine-textured soils with tough, plastic subsoils like the Susquehanna, Cuthbert, and Leaf series fall in the poor group. In the Piedmont Plateau all rough, broken, or severely eroded land such as the Wilkes soils; and in Oklahoma and Texas areas such soils as the Orelia or Wilson clays or the Frio silty clays are in this group.

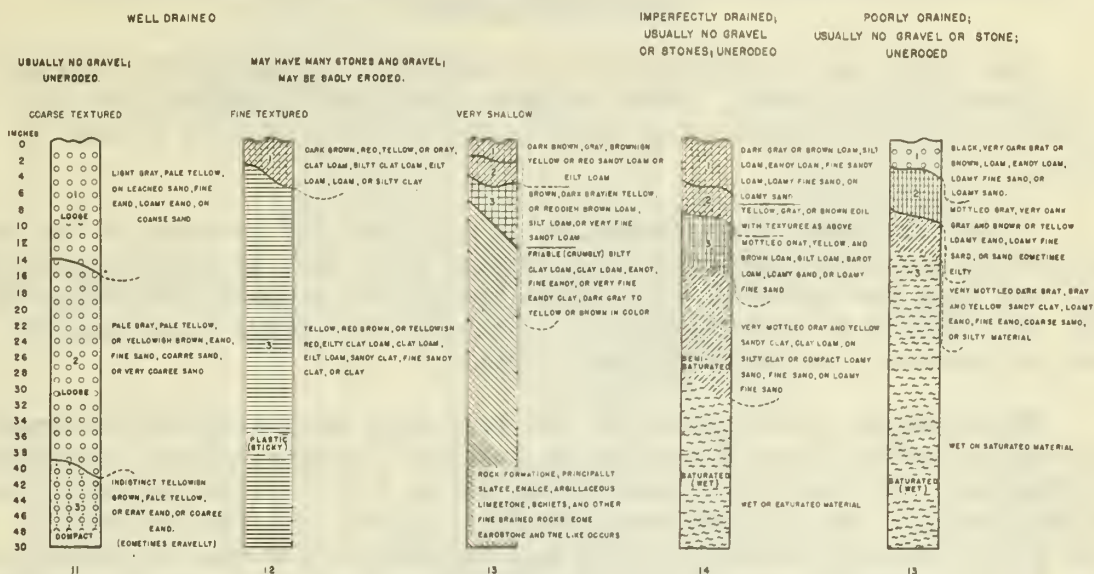
The poor soil types have one or more conditions that either limit the growth of peanuts or interfere with the proper tillage of the land. The unfavorable conditions are more extreme than those of the fair soil types.

Profile diagram No. 11 illustrates such poor soils as Blanton loamy sand or Norfolk sand. In each instance the soil is so loose, sandy, and deep that it can be used for little besides forestry.

Profile diagram No. 12 represents large areas of soils in the Slate Belt of the Carolinas and in the Black Belts of Alabama and Texas, as well as in certain parts of the Mississippi Basin. The sandy surface layer in which the peanuts can peg and develop is less than 4 inches thick and the subsoil in many types is stiff, plastic, and extremely difficult to displace. When wet it will sometimes "run", and when dry it may harden to a brick-like mass. Such soils are very erodible, difficult to work, and unsuitable for peanuts.

# GENERALIZED PROFILES OF SOILS CLASSIFIED "POOR" FOR PEANUTS

## POOR SOILS \*



UNCONSOLIDATED MATERIALS UNDERLYING ABOVE PROFILES ARE LARGELY MARINE OR GULF SANDS, SILTS, AND CLAYS. SOME WIND-BLOWN DEPOSITS ARE PRINCIPALLY SILTS OR FINE SANDS

\*VERY STONY, STEEP, DESTRUCTIVELY ERODED, ALKALI, AND OTHER UNSUITED SOILS ARE NOT DIAGRAMED

FIGURE 9

Profile diagram No. 13 represents even more shallow soils than those of profile No. 10 in the fair classification. These occur in the Highlands of the South Central Region and of northern Alabama, and in the Piedmont Plateau. Rock outcrops are frequent in most fields with such shallow soil, and farming is done literally between the ledges. Yields of peanuts are low.

Profile diagram No. 14 represents poorer drainage conditions than those of the imperfectly drained soils in the fair class (profile No. 6). The depth to the damp or semi-saturated layer in the imperfectly drained poor soil is only 10 to 12 inches, compared with nearly 24 inches for the imperfectly drained fair soil. Drainage is more difficult in the poor soil than in the fair soil, but both can be used for the production of peanuts if the proper steps are taken. Yields are likely to be somewhat undependable, weeds more difficult to control, and root rot may be more prevalent in the soils represented by profile No. 14 than in those represented by No. 6.

The most poorly drained soils in which peanuts are grown are represented by profile diagram No. 15. They occur in great areas over the Lower Coastal Plain or Flatwoods along the Atlantic and Gulf Coasts; especially bordering swamps and rivers, and in the "bays" or "pocosins" and other low places. The poorly drained profile is generally semi-

saturated almost to the surface, is usually very dark grey, black, or mucky in the surface layers, and intensely mottled or grey in the subsoil.

### Location and Extent of Soil Suitable for Peanuts by Major Soil Association Areas

The South can be divided into a number of distinct soil regions or soil-association areas. Each of these contains a combination or geographic association of soils that is different from that in the others.

Figure 10 shows the percentage of all land 11/ in each of the soil-association areas within the peanut-growing belt that is excellent, good, fair, and poor for peanuts. The areas having the highest percentage of soils well suited to peanuts together comprise the large physiographic division known as the Eastern Coastal Plain.

This region is comprised of the following soil-association areas: The Norfolk Ruston (Area E-2) located largely in eastern North Carolina and Virginia, the Norfolk-Ruston-Tifton (Area E-8) located primarily in southern Georgia and Alabama and northern Florida, the Tifton-Norfolk (Area E-12) in southwestern Georgia and the Greenville-Magnolia-Faceville (Area E-11) commonly known as the Coastal Plain Red Belt area of Georgia Alabama. The proportion of all land classified as excellent and good soil for peanuts ranges from 51 to 60 percent in these areas.

Other portions of the Coastal Plain in the Gulf States, both east and west of the Mississippi River, have a considerably lower percentage of soils well suited to peanuts. These areas have a higher percentage of soils with heavy subsoils and a smaller percentage with gentle surface relief than the areas in the Eastern Coastal Plain. The westernmost areas of the peanut region have the disadvantage of inadequate rainfall as compared with those farther east. The Ruston-Bowie-Shubuta (Areas E-14 and W-2) is the most extensive soil-association area in the Gulf Coastal Plain. The proportion of soils classed as excellent and good amount to 37 and 30 percent respectively of all land in these areas.

The Duval-Webb area located in the Rio Grande Plain Area in Texas has the largest proportion of all land classified as good or excellent for peanuts of any soil-association area west of the Mississippi amounting to 53 percent of the land area. These soils occupy large areas of undulating to gently rolling sandy plains.

The Stephenville-Windthorst area (Area W-11), commonly known as the West Cross Timbers area, has a moderately high percentage of land suited to peanuts. The Stephenville area (Area W-16), which comprises

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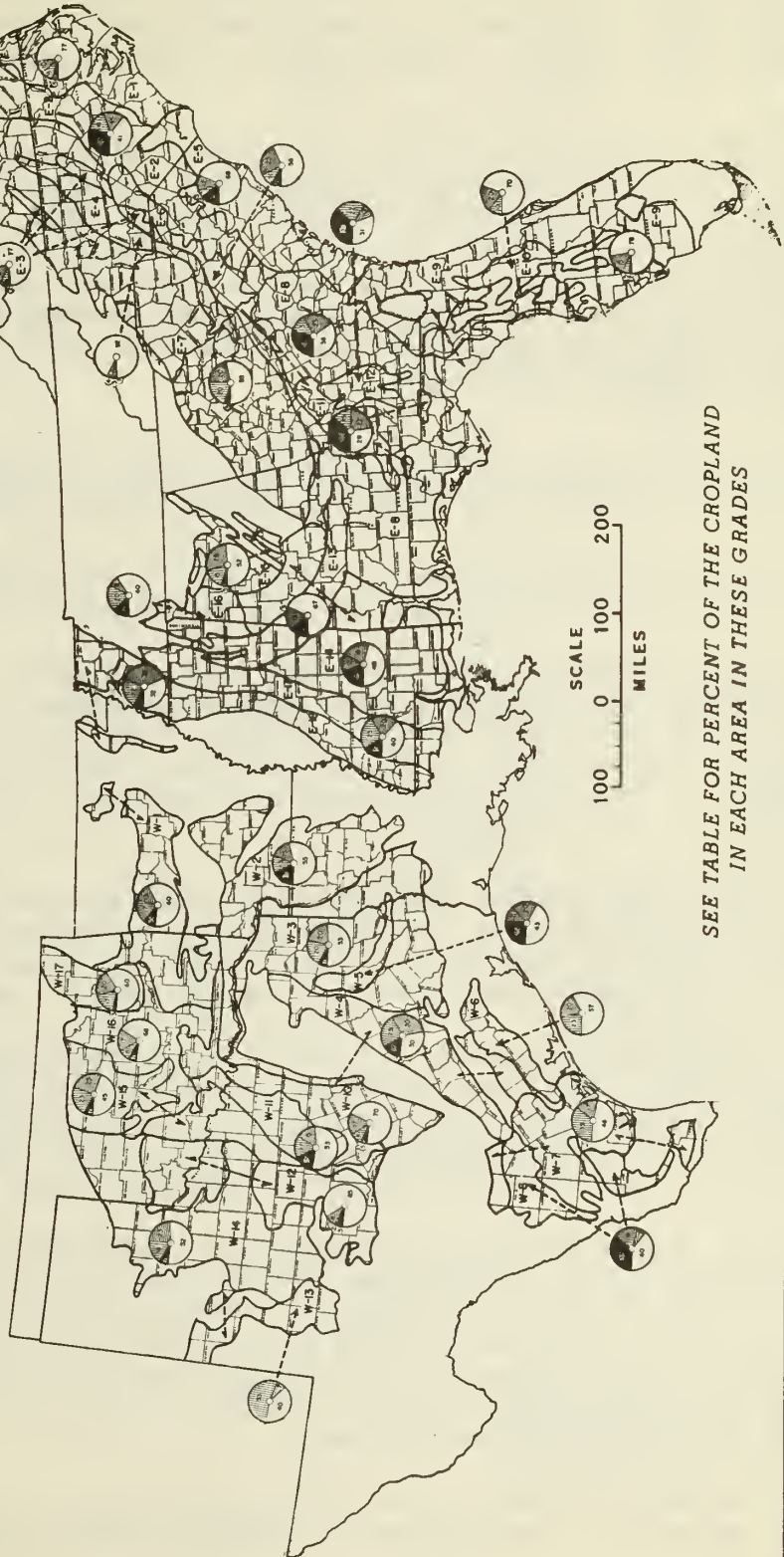
11/ Here the relative extent of the several classes of soil is given in terms of percent of total land area. Note that in table 7 and in tables dealing with type-of-farming areas, relative extents are given in terms of percent of cropland.

# DISTRIBUTION OF SOILS PHYSICALLY SUITED TO PEANUTS

APPROXIMATE PERCENT OF ALL LAND IN EACH AREA



(AREAS WITHOUT CIRCLES HAVE VERY LITTLE SOIL SUITED TO PEANUTS)



SEE TABLE FOR PERCENT OF THE CROPLAND  
IN EACH AREA IN THESE GRADES

FIGURE 10

a large proportion of the soils in the Cross Timbers of Oklahoma, has a considerably lower percentage of the land in soils classified as good and excellent for peanuts. In both of these areas the proportion of cropland suited for peanuts is considerably higher than the proportion of total land. There are large tracts of stony non-arable land in some parts of these areas.

Little commercial production is found in the other soil-association areas in the South except in a few isolated localities. Suitable soils are widely scattered and occur in small tracts. Such areas include the Piedmont, the Atlantic and Gulf Coast Flatwoods and Hill areas of Mississippi and Alabama. In the western Texas and Oklahoma Plain areas the low rainfall and the danger of wind erosion makes peanut production hazardous although a moderately high proportion of the soils may be otherwise physically suitable.

#### RELATION OF PHYSICAL AND ECONOMIC CONDITIONS IN DETERMINING THE LOCATION AND EXTENT OF PEANUT PRODUCTION

Type-of-farming areas have been used in this analysis to segregate the production areas with similar physical and economic conditions.

Type-of-farming areas are based on a combination of soils, climate, productivity, and economic factors which make farming conditions and opportunities relatively uniform throughout each area. The location of the type-of-farming areas in the 11 principal peanut States are shown in figure 11. These areas are based on county-line delineations to facilitate the use of statistics.

Soils and economic information were summarized in this study for each type-of-farming area physically adapted to peanut production. Soil estimates were not available for all counties and the estimates for the type-of-farming areas were based on data for sample counties.

Commercial production of peanuts is important in relatively few of these areas. Data showing the percentage of cropland classified as excellent, good and fair for peanuts for 19 selected areas are found in table 7. The bulk of the commercial peanut production is located in these areas. Data for other areas are shown in appendix table 3.

The 19 selected type-of-farming areas are located in the Coastal Plain of Virginia, North Carolina, and the Southeast, and in the Sandy Land sections of Oklahoma and Texas. At times two or more of these type-of-farming areas are combined into production areas for purposes of discussion. For example, the Peanut-Cotton Area VII of Virginia and the Northern Coastal Plain Area III of North Carolina are combined to form the Virginia-North Carolina area.

Some soils in each of the 19 selected areas are well suited to peanuts (table 7). The proportion of cropland made up of excellent,

## TYPE OF FARMING AREAS: 11 SOUTHERN STATES



FIGURE 11

Table 7.- Percentage of cropland suitable for peanuts  
in selected type-of-farming areas <sup>1/</sup>

Type-of-farming area	Percentage of cropland suitable for peanuts			
	A-	excel-	B-good	C-fair
	lent			Total
	:	:	:	:
Virginia-North Carolina Area:				
Peanut-Cotton Area Virginia VII	57	27	7	91
Northern Coastal Plain N.C. III	34	26	9	69
Central Coastal Plain N.C. IV	50	27	16	93
Georgia-Florida-Alabama Area:				
Southwestern Coastal Plain Area Georgia VII	62	29	7	98
Southeastern Coastal Plain Alabama VIII	43	14	16	73
Coastal Plain (Red Belt) Georgia VI	57	20	18	95
Southeastern Coastal Plain Georgia IX	56	26	13	95
Coastal Plain Florida XIII	45	20	15	80
Sandhills Georgia V	19	41	17	77
Middle Coastal Plain Alabama VI	18	15	27	60
Upper Coastal Plain Georgia VIII	39	34	16	89
Upper Coastal Plain S. C. IIIb	54	15	19	88
Texas and Oklahoma Areas:				
Rio Grande Plain Texas VIII <sup>2/</sup>	40	25	11	76
Cross Timbers Oklahoma VII, VIII and XV	19	19	21	59
Cross Timbers Texas XII	26	25	17	68
Coastal Plains Oklahoma XVI	18	28	14	60
Northeast Texas Sandy Land Texas XV	23	30	21	74
Ouachita Highlands Oklahoma XIV	27	36	13	76

<sup>1/</sup> Based on 1939 Census cropland acreage.

<sup>2/</sup> Adjusted to include only the subarea in which peanuts are important.

good, and fair for peanuts ranges from 98 percent in the Southwestern Coastal Plain of Georgia to 59 percent in the West Cross Timbers of Oklahoma. The acreage of suitable soils is important in some of the intensive production areas in setting an upper limit on the land that should be planted to peanuts in a stabilized farming system (table 8). Variations in the proportion of suitable land planted to peanuts are dependent on the other physical and economic conditions. The characteristics of the soil often represent a basic limitation to peanut production. Peanuts can be produced successfully only on soils that are physically adapted to their production. But in areas where a substantial acreage

Table 8.- Proportion of suitable cropland soils used for peanuts picked and threshed in 1943 by type-of-farming areas 1/

Type-of-farming area	: 1943 peanut acreage : 1943 :picked and threshed : peanut : as : acreage : Percentage of:		
	: picked : : and : : threshed : : :	: Total : Good and : : excellent: (Good, excel- : soils :lent and fair : : soils)	
	: 1,000 : acres	Percent	Percent
Peanut-Cotton Area, Virginia VII	: 148.0	41.0	37.9
Northern Coastal Plain, N. C. III	: 199.4	45.7	39.9
Central Coastal Plain, N. C. IV	: 53.6	7.8	6.4
Southwestern Coastal Plain, Georgia VII	: 453.0	36.8	34.3
Southeastern Coastal Plain, Alabama VIII	: 389.8	39.9	31.2
Coastal Plain Red Belt, Georgia VI	: 256.0	37.8	30.6
Southeastern Coastal Plain, Georgia IX	: 171.0	13.6	11.7
Middle Coastal Plain, Florida XIII	: 87.6	18.3	14.9
Sandhills, Georgia V	: 34.0	15.5	12.1
Middle Coastal Plain, Alabama VI	: 14.3	19.1	10.5
Upper Coastal Plain, Georgia VIII	: 130.0	13.1	10.8
Upper Coastal Plain, S. C. IIIb	: 36.6	6.8	5.3
Rio Grande Plain, Texas VIII <u>2/</u>	: 160.0	22.5	19.3
Cross Timbers, Oklahoma VII, VIII, XV	: 108.0	12.6	8.1
Cross Timbers, Texas XII	: 255.0	38.3	28.6
Coastal Plain, Oklahoma, XVI	: 46.0	18.5	14.1
Northeast Texas Sandy Lands, Texas XV	: 120.0	7.8	5.6
Ouachita Highlands, Oklahoma XIV	: 37.0	14.2	11.7

1/ Based on 1939 acreage of cropland reported by U. S. Census of 1940.

2/ Includes only the subarea in which peanuts are important.

of the soil is suitable for peanuts, the acreage may be small for several reasons. The acreage of suitable soils may be scattered and the fields too small for economical production. The yields of alternative crops may be even more favorable than the yields of peanuts. Peanuts may not fit into the type-of-farming that has proven to be profitable in the area. The interrelationship of soils, other physical conditions, and economic factors determines the importance of peanuts in the farming systems. Even under wartime conditions, the acreage of peanuts has tended to remain concentrated in a relatively small number of localized areas where they represent a major cash crop.

### Yields of Peanuts and Cotton by Soil-Suitability Groups

The relative yield of peanuts and alternative crops, particularly cotton, is one of the most important factors affecting the acreage of peanuts. Yields are affected by several factors other than soils, including rainfall, temperature, crop varieties, and cropping practices. Climatic factors are generally fairly uniform throughout a type-of-farming area but vary materially in different parts of the peanut belt. For example, climatic conditions in the subhumid Rio Grande Plain of Texas are quite different from those in the Virginia-North Carolina areas. Varieties have a pronounced influence on yields. The Virginia Bunch and Runner varieties are generally higher yielding in adapted areas than Spanish varieties, while some areas well adapted to Spanish peanuts have not successfully grown Virginia Bunch or Runner varieties. In general, better cropping practices have been followed in the older peanut areas and this has tended to increase yields in these areas.

The yields that could be normally expected from peanuts on excellent, good, and fair soils were estimated for each of the selected type-of-farming areas (table 7). Similar estimates were made for cotton which is the major competing crop in most of these areas. Yield levels for peanuts were based largely on the 1937-41 average yield. In a few areas having little commercial production during the 1937-41 period recent yields were used in ascertaining the normal yield for the area.

Cotton-yield levels were based on 1937-41 yields adjusted, where necessary, for type of soils on which peanuts are grown. Variation in cotton and peanut yields on soils classified as excellent, good, and fair for peanuts were based on farm records of average yields on fields classified according to the suitability of the soil for peanuts, Experiment Station reports of average yields by soil types, soil surveys with productivity ratings, and judgment ratings of members of Experiment Station staffs.

An examination of the yields shown in table 9 indicates that yields of peanuts on all soils suitable for peanuts decline rather rapidly as one moves from North to South and East to West in the belt. Peanut yields on excellent soils for peanuts in the Virginia-North Carolina region are about 75 percent higher than those in the Georgia-Alabama-Florida region and about 125 percent higher than in the Oklahoma-Texas region. In fact, yields on fair soils for peanuts in Virginia-North Carolina are about as high as yields on excellent soils for peanuts in Oklahoma and Texas.

Cotton yields also decline in going from North to South and East to West, in the peanut belt. However, the decrease in yields is not so marked in cotton as in peanuts. In the western part of the belt there is considerably less variability in cotton yields among soil suitability groups than in eastern sections.

Table 9.- Peanuts and cotton: Estimated yields by soil-suitability groups, selected type-of-farming areas 1/

Type-of-farming area	Peanuts:				Cotton:			
	Pounds of nuts per acre				Pounds of lint per acre			
	A- : excel- : lent	: B-good: : C-fair: : lent	: Average : yield <u>2/</u> : lent	: A : excel- : lent	: B-good: : C-fair: : lent	: Average : yield <u>2/</u> : lent	: C-fair: : C-fair: : lent	: Average : yield <u>2/</u> : lent
Virginia-North Carolina area								
Peanut-Cotton Area, Virginia VII	1,440	960	640	1,234	325	280	185	298
Northern Coastal Plain, N.C. III	1,545	1,090	635	1,263	370	290	185	317
Central Coastal Plain, N.C. IV	1,260	1,035	630	1,087	340	260	160	285
Georgia-Florida-Alabama area								
Southwestern Coastal Plain, Ga. VII	860	645	395	760	245	190	115	221
Southeastern Coastal Plain, Ala. VIII	900	605	375	730	245	160	125	203
Coastal Plain Red Belt, Georgia VI	845	615	400	707	240	190	115	203
Southeastern Coastal Plain, Ga. IX <u>3/</u>	900	655	390	760	230	185	110	201
Middle Coastal Plain, Florida XIII	815	570	325	660	205	130	80	162
Sandhills, Georgia V	750	555	365	560	265	170	75	172
Middle Coastal Plain, Alabama VI	770	540	310	505	275	180	105	176
Upper Coastal Plain, Georgia VIII	825	640	395	676	255	210	120	213
Upper Coastal Plain, S. C. IIIb	750	570	345	626	330	275	155	284
Texas and Oklahoma areas								
Rio Grande Plain, Texas VIII	555	420	260	468	---	---	---	---
Cross Timbers, Oklahoma VII, VIII, XV	720	530	290	504	200	150	125	<u>4/</u> 160
Cross Timbers, Texas XII	585	470	275	464	105	90	75	93
Coastal Plain, Oklahoma XVI	665	440	265	466	170	150	130	<u>4/</u> 150
Northeast Texas Sandy Lands, Texas XV	670	455	270	470	200	175	100	163
Ouachita Highlands, Oklahoma XIV	650	465	280	495	225	175	150	192

1/ Yields for soil-suitability groups based on estimates of soil technicians, adjusted to normal or average yield for the area.

2/ Picked and threshed yields for peanuts, harvested yields for cotton. Based on 1937-41 average yields except in areas where peanuts were not much grown commercially, before 1942. The 1942-45 yields were used in arriving at normal yield for these areas.

3/ Estimated yields for Runner peanuts.

4/ Average yields adjusted for cotton produced on soils suitable for peanuts.

The changes in yields of both crops are in line with the concept of higher yields being obtained toward the northernmost part of the production area of a crop. An explanation of the yield changes from East to West probably has its foundation in climate. Rainfall limits the production of both peanuts and cotton in the subhumid areas of the Southwest. That rainfall is a limiting factor in these areas, regardless of cropping practices, probably also explains the smaller variability of cotton yields in the Southwest. As cotton can be grown under a wider range of soil conditions than peanuts, proper rainfall may exercise even more influence on the yields of cotton than of peanuts in these areas. There is a tendency for peanut yields to be higher in the older, more established areas of production regardless of their general location in the belt. For example, yields in the southwestern Coastal Plain of Georgia are higher than in the Upper Coastal Plain of South Carolina, a new area, even though the latter is further north.

### Influence of Production Methods

The influence of production practices and the associated efficiency of production in determining the location and extent of peanut production is usually not so apparent as that exerted by physical factors but it is evident nonetheless. As agriculture becomes increasingly commercialized the economic considerations of relative costs and returns become the primary influence in the choice of enterprises within ranges established by physical factors previously discussed. The production of commercial farm products tends to become specialized in one enterprise, or combination of enterprises, that yields the greatest profit as compared with other alternatives.

The farmers' choice of enterprises is based largely on present production practices and efficiency of production. Production practices and efficiency in production of peanuts as discussed in this section deals with the present usual methods of production as found in field studies made during recent years in the areas.

The economic considerations of production costs and relative efficiency are closely related with physical factors of soils, climate, and topography. The progress of mechanized production in the Rio Grande Plain, for example, has been closely associated with characteristics of rainfall and topography. Conversely, attempts to mechanize harvesting methods in the Southeast have faced difficulties occasioned by damage to the nuts due to rainfall during the harvest period.

Variation in the efficiency of the use of labor is perhaps the most striking difference in production practices among the areas, but this does not take account of differences in wage rates and abilities in different sections. Also it does not account for variation in enterprise practices other than labor. The use of income budget of relative income and expenses of peanuts and alternative cash crops is a guide to comparative advantage of the crop in different areas.

The variation in the labor required for producing peanuts with usual methods of production is very wide. Man labor required per acre for peanuts varies from 67 hours in the Northern Coastal Plain of North Carolina to 16 hours in the West Cross Timbers of Texas (table 10). Differences in climate, soils and topography have resulted in wide variation in production practices, levels of equipment, and peanut yields. Yields vary from approximately 1,200 pounds in North Carolina to less than half that in the Western subhumid areas. In the humid areas peanuts are usually produced with horse power and much hand labor while in the West Cross Timbers and Rio Grande areas tractor power and mechanized methods are used.

The least man labor per unit of product is required in the subhumid areas where production is mechanized and in North Carolina where yields of peanuts are very high (fig. 12). Labor requirements per ton of peanuts are greatest in the eastern Texas and northeastern Oklahoma area where yields are low and mechanized methods of production are not yet common.

The principal difference in the production practices used on peanuts in the different areas is related to the degree of mechanization. The relatively dry climate and larger fields in the subhumid areas have permitted a high degree of mechanization while in the Virginia-Carolina area and in the Southeast peanuts are produced largely with hand and mule labor.

The production practices commonly followed in growing peanuts are not always the best. The number of farmers following any significant number of improved practices is much too small. In general, better practices are followed in the old than in the new peanut areas. This is to be expected in view of the length of experience of farmers in the two kinds of areas.

#### RELATIONSHIP OF RETURNS FROM PEANUTS AND COMPETING CROPS

The agriculture in most of the peanut areas is characterized by a cash-crop economy. Feed crops on most of the farms are produced for home use and for supplemental income.

The relative profitableness of peanuts and competing cash crops on the different groups of soils provides a good insight into their production possibilities in the postwar period if the returns are considered in the light of the present organization of the farms in the various type-of-farming areas.

Peanuts and cotton have been used as the basis for comparison in nearly all of the areas as they are the major cash crops. Comparison in returns between the two crops is made easier by the similarities between them. Both are cash crops requiring relatively large amounts of labor with peak requirements coming at the same seasons. Both are

Table 10.- Peanuts: Usual operations and labor used per acre, selected areas  
(based on studies in each area.) <sup>1/</sup>

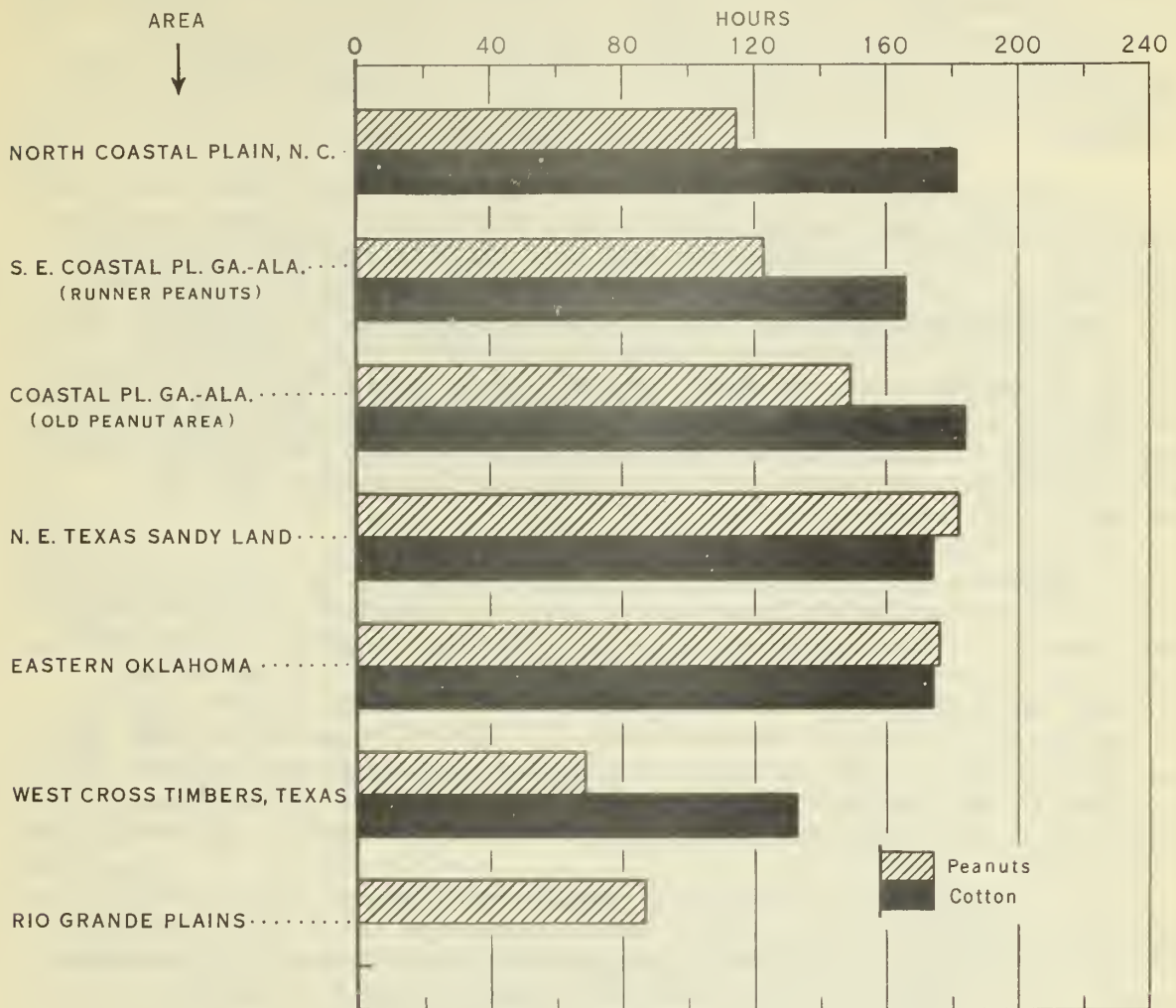
Area	Man labor required by operations										Total labor required <sup>2/</sup>			
	Prepare and plant	Cultivate	Hoing	Digging and stack-ing	Picking and baling	Man	Horse	Tractor	Estimated yield		Hours	Hours	Hours	Pounds
Northern Coastal Plain, N. C.	14.0	10.0	8.5	21.0	13.5	67.0	42.0		1,170					
Southeastern Coastal Plain, Ga. <sup>4/</sup>	9.4	10.0	---	28.0	8.0	55.4	36.5		900					
Coastal Plain, Georgia-Alabama (old peanut area)	13.0	9.0	8.0	22.0	8.0	60.0	43.0		800					
Eastern Oklahoma	8.3	8.2	7.0	22.5	7.0	53.0	42.1		600					
Northeast Texas Sandy Lands	8.4	8.0	10.0	21.7	6.9	55.0	34.5		600					
West Cross Timbers, Texas	1.6	1.4	5.0	3.0	5.0	16.0	3.3	4.2	460					
Rio Grande Plain, Texas	2.3	2.5	6.7	3.5	6.0	21.0	---	7.0	480					

<sup>1/</sup> Adapted from studies made in Halifax County, N.C., Bulloch and Terrell Counties, Ga., Henry County, Alabama, Smith and Frio Counties and West Cross Timbers area in Texas, and Bryan, Choctaw, and Okfuskee Counties in Okla. Some adjustment from published figures necessary in some cases to show data for specific levels of equipment and to synthesize information in cases where more than one study was made in the same area or where data were for a particular year.

<sup>2/</sup> Does not include contract labor and labor used in hauling product to market. Usual labor requirement for farms having 2 or more mules for all areas except West Cross Timbers and Rio Grande Plain where two-row tractor operation is most common.

<sup>3/</sup> Usual yields as estimated in the studies; these vary somewhat from yields for the area as a whole.  
<sup>4/</sup> Runner peanuts.

# MAN-LABOR REQUIREMENTS PER TON OF PEANUTS AND BALE OF COTTON, SELECTED AREAS\*



\* BASED ON SAMPLE STUDIES IN EACH AREA

U. S. DEPARTMENT OF AGRICULTURE

FIGURE 12

NEG. 46340

BUREAU OF AGRICULTURAL ECONOMICS

clean tilled, and similar plowing, planting, and cultivating equipment are used for each.

Cotton and peanuts supplement each other to some extent, however, for both of the crops work well in a 3-year rotation with peanuts following cotton. This is particularly true where cotton is heavily fertilized; peanuts make good use of residual fertilizer. Small differences in the peak labor requirements mean some efficiencies in the use of labor when both crops are grown. Thus slight advantages shown for growing either cotton or peanuts alone may be more than compensated by advantages inherent in growing substantial acreages of both crops.

Returns per acre for land, management, and miscellaneous overhead expense have been used as a basis for comparing returns from enterprises. This represents the amount remaining after deducting from the gross value of the product, the specified expenses for production supplies and services (such as fertilizer, peanut picking, or cotton ginning), the estimated value of labor used in production, and charges for power and equipment.

Usual production requirements and estimated yields that would be obtained on the specified groups of soils were used as a basis for these estimates. Prices and costs per unit used in this analysis were those prevailing in the respective areas in 1943. The price level in that year was considerably higher than in prewar years but is generally similar to the level estimated for prosperous conditions in the postwar world.<sup>12/</sup> Peanut prices in 1943, however, were higher relative to those for competitive crops than has often been true in the past. Because of the frequent wide variation between prices of peanuts and cotton, estimates of returns were also prepared using varying prices with the estimated 1943 costs.

Relative returns calculated on this basis can be only rough guides because of the variation from farm to farm in equipment and practices that directly affect costs and returns. In the following section some attention is given to the effects of larger equipment, labor-saving methods, and improved production practices on the competitive position of peanuts and cotton in the major areas. The value of labor used in production and charges for workstock, power, and equipment may also be expected to vary considerably from the estimated usual situation, depending on the individual farming system and alternative opportunities.

The competitive position of peanuts must be considered in the setting of the farm organization and cropping systems found in each of the type-of-farming areas where peanuts are grown in order to appraise properly the adjustments that should be made in peanut production. A well-balanced organization in some areas would call for some reduction in peanuts even though yields and returns from them are high. In other areas present acreages could be maintained. In some areas peanut production with normal price relationships would represent an inefficient use of the land and labor.

#### Virginia-North Carolina:

##### Southeastern Virginia-northeastern North Carolina

Sixteen counties located in southeastern Virginia and northeastern North Carolina comprise the production area commonly known as the old edible-nut area of Virginia and North Carolina (Virginia Area 7 and North Carolina Area 3 in fig. 11). This is the oldest peanut-

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<sup>12/</sup> See "What Peace Can Mean to the American Farmer" U. S. Dept. of Agr. Misc. Pub. 562, 1945.

producing section in the country. The old and well-established agriculture here is characterized by keen competition between cash crops. About half the cropland is occupied by cash crops. Peanuts, cotton, and tobacco and, in some sections, soybeans are grown. Tobacco in terms of net returns under present prices commands the most favorable position among the enterprises but tobacco acreage has been regulated by production controls for many years. The expansion of soybeans for beans was stimulated by wartime demands and scarcity of labor, particularly on the larger farms.

Crop yields in general are higher here than in many other parts of the South. The 1937-41 average yield per harvested acre for peanuts in the northern Coastal Plain of North Carolina was 1,263 pounds, for cotton 309 pounds, for soybeans 12.0 bushels, for tobacco 928 pounds, and for corn 21 bushels. Favorable yields and returns from cash crops have put a high proportion of the acreage in these crops. Present crop organization, and changes that have occurred in crop acreage and related items during the war, are shown in table 11. These data were tabulated from county data from the U. S. Census. In evaluating them it should be remembered that the Census definition of a farm differs from the farm-management concept of a farm as an operating unit in that each cropper family is considered by the Census as a separate farm unit. Furthermore, because of the wide range of sizes and systems of farming in some areas such arithmetic averages are not always representative.

There was relatively little change in this area during the war. Before the war favorable returns to peanuts associated with the high yields obtained had caused most farmers to plant close to the largest peanut acreage that could be maintained in the farming systems. These systems were generally built around peanuts as the major cash crop. Differences in systems between size groups have been small. During the war there was some tendency for larger farmers to increase their acreage of oats and other small grains as alternatives to corn. Tobacco acreage declined slightly compared with 1939, as a result of the imposition of quotas. Harvested crop acreage per farm declined slightly.

Soils in the area as a whole are very suitable for intensive growing of peanuts. The Virginia part has a particularly high proportion of its soils classified as suitable for peanuts, totaling over 90 percent of the cropland. Soils in the North Carolina part are not quite so homogeneous. Some of the soil types in the eastern part of the area are poorly drained and some of the counties extend into the Piedmont which has soils generally less favorable for peanuts. Peanuts are grown on the well-drained sandy loam soils which predominate in both sections of the production area. Norfolk and Ruston sands and sandy loams are the most important of these soil types. The principal poorly drained soils are of the Dunbar and Portsmouth series.

Relatively favorable yields of peanuts are obtained on all suitable groups of soil. Very high yields of peanuts, averaging over 1,400 pounds to the acre, are common on soils classified as excellent.

Table 11.- Size of farm, acreage of principal crops and associated data, Southeastern Virginia, Northeastern North Carolina, 1939-44 1/

Item	Acreage or number		Percentage of cropland	
	per farm		in specified	
			crops	
	1939	1944	1939	1944
All land in farms	91.7	88.3	--	--
Cropland harvested	32.2	31.2	100.0	100.0
Peanuts grown alone	11.6	11.9	36.0	38.1
Peanuts picked and threshed	(11.5)	(11.8)	(35.7)	(37.8)
Cotton	3.2	3.4	9.9	10.9
Tobacco	1.6	1.3	5.0	4.2
Corn	11.8	11.1	36.6	35.6
Oats fed or threshed	0.3	0.6	0.9	1.9
Soybeans grown alone	1.6	1.2	5.0	3.8
Peanuts (picked and threshed)				
acreage per farm growing	12.6	13.2	--	--
Sows farrowing (spring)	1.3	1.5	--	--
All hogs and pigs	5.6	12.1	--	--
Peanut yield (pounds per acre)	1,227.2	1,219.7	--	--
Farms, number	25,440	26,264	--	--

1/ Based on U. S. Census.

Examples of these soils include such types as Norfolk, Ruston and Orangeburg fine sandy loams and sandy loam soils (appendix table 2).

Cotton yields on these soils are fairly good but are low relative to the very high yields of peanuts. Lower yields of peanuts are obtained on soils classified as good and fair, but yields from cotton are also lower. Thus soils classified as fair for peanuts are usually also only fair for cotton and relative yields are favorable for peanuts even on fair soils. Generally, yields of peanuts are high in this area both in relation to yield obtained in other areas and in relation to yields of cotton and alternative crops.

Yields and requirements for peanuts and cotton.- Information regarding requirements and yield used in this section applies to the northern Coastal Plain type-of-farming area in North Carolina. The information on farm practices was adapted from data collected from farmers in this area in 1941 and 1943. The basis of yield estimates for the three groups of soils has been explained. Conditions in the northern Coastal Plain are similar to those in the adjoining Virginia

section and it is believed that the general conclusions in this section will also apply to the production area as a whole.

Details of production requirements and unit costs for cotton and peanuts in the northern Coastal Plain area are given in appendix table 4. These crops as there grown are produced mainly with mule and hand labor and compete with one another for labor especially during peak periods - at cultivating and harvest time. Cotton requires considerably more labor per acre than peanuts chiefly because of additional hoeing and harvesting work.

Peanuts as commonly grown in this area are fertilized with a lime potash material at planting, and later at full bloom stage are side dressed with land plaster. Little or no nitrogen fertilizer is used and some of the farmers use no fertilizer. A survey of 128 farms in Halifax County, by McPherson, Sayre, and Green, showed that approximately two-thirds of the farmers applied fertilizer on peanuts at planting time and about three-fourths of the farmers top dressed with land plaster. <sup>13/</sup> Land plaster is recommended for use on light sandy soils and on acid soils. If peanuts follow a highly fertilized crop some farmers do not fertilize them as they make good use of residual fertilizer from previous crops. Cotton fertilizers contain more nitrogen and are more expensive. Cotton usually is given a mixed fertilizer and is later side dressed with nitrate of soda or sulphate of ammonia. The yield estimates for different soil groups assumed that similar practices would be used on each group of soils except for some differences closely related to the yields. The differences in requirements on the three soil groups are confined to such things as harvest labor, picking, and hauling. Estimates of total specified costs per acre are slightly higher for cotton than for peanuts on all soil groups in the Northern Coastal Plain (table 12).

Relative returns.- Based on normal yields and 1943 prices, peanuts occupy a very favorable position relative to cotton on all soil groups classified as suitable for peanuts. On excellent soils the returns to land and management per acre would be \$73.31 for peanuts and \$33.81 for cotton. The differences are somewhat less for the good and fair soil groups, but show substantial income advantages for peanuts on all three groups. With Virginia Bunch peanuts selling at 6 cents a pound and cotton lint at 25 cents, the returns from peanuts and cotton would be about equal on excellent soils (table 13). Relative returns on good and fair soils would be somewhat more favorable to cotton than to peanuts on a per-acre basis.

The estimated yields for cotton and peanuts were based mainly on the 1937-41 average yields of these crops. Since that time cotton yields have increased some in this area and yield relationships are currently somewhat more favorable to cotton than in the prewar period. However,

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<sup>13/</sup> "Producing Peanuts for the Nation's War Needs," by McPherson, W.W., Sayre, C. R., Green, R. E. L., North Carolina Agr. Expt. Sta. and BAE (mimeo.), 1942.

Table 12.- Relative returns per acre from cotton and peanuts on excellent, good, and fair soils for peanuts with 1943 prices and usual yields, northern Coastal Plain, North Carolina 1/

Item	A- Excellent soils		B-Good soils		C-Fair soils	
	Peanuts	Cotton	Peanuts	Cotton	Peanuts	Cotton
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Gross value of crop 2/	:	:	:	:	:	:
Nuts or lint	: 114.33	74.74	80.66	58.58	46.99	37.37
Seed or hay	: 12.00	15.00	9.00	11.75	6.00	7.50
Total	: 126.33	89.74	89.66	70.33	52.99	44.87
Specified costs	:	:	:	:	:	:
Seed	: 5.62	1.80	5.62	1.80	5.62	1.80
Fertilizer	: 2.92	6.38	2.92	6.38	2.92	6.38
Land plaster or side dressing	: 1.80	2.00	1.80	2.00	1.80	2.00
Picking and hauling peanuts	: 8.60		6.05		3.55	
Bags	: 4.30		3.02		1.78	
Baling and wire	: 2.97		2.20		1.43	
Hauling to gin	:	0.74		0.58		0.37
Ginning, bags, and ties	: 0.20	3.52		2.76		1.76
Miscellaneous	: 0.20	1.50	0.20	1.50	0.20	1.50
Labor	:	:	:	:	:	:
Pre-harvest man labor	: 6.50	12.20	6.50	12.20	6.50	12.20
Harvest man labor	: 10.45	16.98	9.35	13.30	7.98	8.49
Mule and equipage charge	: 9.66	10.81	9.66	10.81	9.66	10.81
Total	: 53.02	55.93	47.32	51.33	41.44	45.31
Returns for land, overhead, and management per acre 3/	: 73.31	33.81	42.34	19.00	11.55	- .44

1/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 4 and 11.

2/ Based on average prices of 7.4 cents per pound for peanuts and 20.2 cents per pound for cotton.

3/ Represents the amount left after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of product. Excludes land-rent management and general overhead expenses such as taxes, building costs, winter cover crops, etc.

Table 13.- Relative returns per acre for peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, northern Coastal Plain, North Carolina 1/

Soil groups and yields <u>2/</u>	Peanuts: Cents per pound						
	: .09	: .08	: .07	: .06	: .05	: .04	
	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars	
<u>Excellent</u> soils (1545 lbs.)	: 98.03	82.58	67.13	51.68	36.23	20.78	
<u>Good</u> soils (1090 lbs.)	: 60.83	49.93	39.03	28.13	17.23	6.33	
<u>Fair</u> soils (635 lbs.)	: 21.71	15.36	9.01	2.66	- 3.69	-10.04	
Soil groups and yields <u>2/</u>	Cotton: Cents per pound						
	: .28	: .25	: .22	: .19	: .16	: .13	
	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars	
<u>Excellent</u> soils (370 lbs.)	: 62.67	51.57	40.47	29.37	18.27	7.17	
<u>Good</u> soils (290 lbs.)	: 41.62	32.92	24.22	15.52	6.82	- 1.88	
<u>Fair</u> soils (185 lbs.)	: 13.99	8.44	2.89	- 2.66	- 8.21	-13.76	

1/ Returns to land overhead and management, with estimated usual yields for each group of soil.

2/ Soil grouping based on suitability for peanuts.

these recent changes in yield relationships would not materially alter the competitive situation with respect to cotton and peanuts. Furthermore increased cotton yields are offset by the fact that larger amounts of fertilizer and other production requirements have been associated with this increase. Fertilizer requirements used in this analysis are based on practices used before the war.

Peanuts in the farm organization.- Because of the favorable position of peanuts as a profitable cash enterprise farmers have placed major emphasis on them in this area. Almost every farmer grows some peanuts. In the main, the first choice of resources have been given to peanuts and, on farms that have tobacco allotments, to the acreage of that crop that can be grown under the tobacco program. There has been considerable competition between peanuts and cotton, but in recent years more favorable returns have usually come from peanuts than from cotton. In the main, feed crops have been fitted into the farm organization to utilize the remaining resources and provide farm feed and food. Apparently there is little difference in the organization of small and large farms following peanut-cotton or peanut-cotton-tobacco systems.

Present peanut acreages, however, appear to be higher than should be maintained in a permanent system of farming. Nearly two-fifths of the harvested cropland was in peanuts in 1944; much of the idle cropland is unsuited to them. As has been pointed out, this acreage would be equivalent to approximately 40 percent of the total cropland and idle acreage classified as suitable for peanuts in this area. The percentage of suitable land planted to peanuts in Virginia would be only slightly lower. Available data and the experience of peanut growers both seem to indicate that desirable rotations that would maintain soil resources would not permit planting peanuts oftener than once in 3 years. If such a rotation is approximated, peanut acreage apparently would need to be reduced to slightly below the prewar 1937-41 average.

#### Other Areas in Virginia-North Carolina

The other principal commercial area in the Virginia-North Carolina region is located in the central Coastal Plain of North Carolina. The remainder of peanut acreage in Virginia and North Carolina is scattered throughout several areas and is of minor importance in the farming systems.

Well-drained sandy loam soils predominate in the central Coastal Plain (Area 4) of North Carolina. About 50 thousand acres of peanuts were planted there in 1943. Unlike the northern Coastal Plain this area has a large acreage of soils that are well suited to peanuts and not used for them. The peanut acreage nearly doubled during the war but present acreage still represents a small percentage of the soils classified as suitable (table 8). Peanut yields are somewhat lower in this area particularly on soils classed as excellent for peanuts. Tobacco and cotton are the principal cash crops and offer keen competition for the use of cropland and labor.

#### The Southeast

The Coastal Plain region in South Carolina, Georgia, Alabama, and Florida contains large tracts of soils suitable for peanuts. Commercial production has been concentrated in the areas where cotton yields have been low because of climate, boll weevil, and other conditions. Yields of peanuts are lower in most of these areas than in the Virginia-North Carolina area. However, the major peanut areas are located in marginal cotton areas where cotton yields have been low. In the Upper Coastal Plain of Alabama, the Upper Coastal Plain of South Carolina, and other areas where cotton yields are fairly high, peanuts were planted mostly for home use before the war and have been only a minor crop during the war. The edible-nut area of Georgia-Alabama contains about 60 percent of the commercial picked and threshed peanut acreage in the four southeastern States.

## Southwest Georgia-Southeast Alabama Area

The old peanut area in southwest Georgia and southeast Alabama comprises the largest contiguous peanut-producing area in the United States, in terms of acreage and production. This area is sometimes subdivided into three State type-of-farming areas: The southeastern Coastal Plain of Alabama; the southwestern Coastal Plain of Georgia; and the Coastal Plain Red Belt of Georgia (Ala. 8, Ga. 7 and Ga. 6., fig. 11). Minor differences in physical production conditions are found in these sections. Soils in the southeastern Alabama area are somewhat mixed, particularly in the western part and on the edges of the Black Belt, but the predominant soils are the same as in the southwestern Coastal Plain of Georgia. On most of the peanut farms in both of these areas the principal soils are of Norfolk, Ruston, or Tifton series which are similar in many of their characteristics and are well suited to the production of both Runner and Spanish peanuts. The Greenville, Magnolia, and Faceville soils which predominate in the Georgia Red Belt section are somewhat heavier in texture than soils in the other sections. Although well adapted to the production of Spanish peanuts, these heavier soils are not so well suited for hogging-off as the Norfolk, Ruston, or Tifton soils.

Yield relationships are generally favorable for peanuts in all three type-of-farming areas; this is particularly true of soils classified as excellent which comprise approximately one-half of the cropland.

The agriculture of the production area as a whole has long been based on a cash-crop economy. During the last 30 years, however, the emphasis has shifted from almost complete reliance on cotton to major reliance on peanuts as a source of cash income. Just before World War II cotton and harvested peanuts were of about equal importance in the farming systems, but during the war peanut acreage increased greatly and now occupies more than 35 percent of the harvested crop acreage (table 14). During this period cotton acreage has been cut almost in half and now occupies only about 11 percent of the cropland. The acreage of cropland harvested per farm has been substantially reduced, through an increase in the idle and abandoned cropland associated with wartime conditions of labor. Cash-crop acreages have been maintained, but feed-crop acreages have been decidedly curtailed. Some of the idle land may be brought back into the rotation over a period of years, but in view of the depleting nature of dug peanuts, it would appear that rotations in this area have been shortened considerably more than desirable if productivity is to be maintained.

Relative returns from peanuts and cotton.- Table 15 shows the relative returns per acre from peanuts and cotton on excellent, good, and fair soils with usual yields and 1943 prices. Per-acre returns to land, overhead, and management are larger for peanuts than for cotton on all soils classified as suitable for peanuts. The advantage to peanuts is largest on the excellent and good soil groups.

Table 14.- Size of farm, acreage of principal crops and associated data, southwest Georgia, southeast Alabama, 1939 and 1944 <sup>1/</sup>

Item	Acreage or number per farm		Percentage of cropland in specified crops	
	1939	1944	1939	1944
All lands in farms	103.9	102.8	—	—
Cropland harvested	48.4	41.9	100.0	100.0
Peanuts, grown alone	11.9	16.4	24.6	39.1
Peanuts, picked and threshed	(9.8)	(15.0)	(20.2)	(35.8)
Peanuts grown with other crops	(2.9)	(0.7)	(6.0)	(1.7)
Cotton	9.7	4.7	20.0	11.2
Corn (all purpose)	21.7	15.8	44.8	37.7
Oats, threshed or fed	.9	1.3	1.9	3.1
All hogs and pigs (number)	6.6	9.5	—	—
Sows farrowing (spring)	1.1	1.3	—	—
Peanuts, picked and threshed, acreage per farm growing	12.6	19.7	—	—
Peanut yield (pounds per acre)	570.1	667.7	—	—
Farms, number	73,855	77,697	—	—

<sup>1/</sup> Based on U. S. Census.

The competitive position of cotton here is apparently stronger than in the Virginia-North Carolina area. In other words, a smaller adjustment in the relative prices of the two crops is necessary to bring cotton and peanuts into competition on the basis of returns. For example, with peanuts and cotton selling at 6 cents and 22 cents per pound respectively (table 16), cotton is slightly favored on all three soil groups, whereas in the Virginia-North Carolina area with 6-cent peanuts it is necessary for cotton to sell at 25 cents a pound in order to equalize returns. But it should be pointed out that these data are based on peanut yields resulting from usual present practices. The level of peanut practices and resulting yields are much higher in the Virginia-North Carolina area. Some farmers in the Georgia-Alabama area, who have adopted improved practices, have obtained yields considerably above those indicated here.

Farm organizations in the Georgia-Alabama area.— Most of the farms in the Georgia-Alabama area are of the peanut-cotton types. Corn is the most important feed crop, but considerable acreages of peanuts are hogged-off. Commercial livestock is limited chiefly to hogs. Commercial hog production and peanut acreage hogged-off are most important on the larger farms (table 17).

Table 15.- Relative returns per acre from peanuts and cotton on excellent good, and fair soils for peanuts with 1943 prices and usual yields, southwest Georgia-southeast Alabama peanut area 1/

Item	: A-Excellent soils		: B-Good soils		: C-Fair soils	
	: Peanuts		: Cotton		: Peanuts	
	: Dollars		: Dollars		: Dollars	
	: Dollars		: Dollars		: Dollars	
Gross value of crop 2/						
Nuts or lint	: 63.51	49.00	: 45.26	36.00	: 28.47	24.00
Seed or hay	: 5.16	11.18	: 3.84	8.42	: 2.64	5.62
Total	: 68.67	60.18	: 49.10	44.41	: 31.11	29.63
Specified costs						
Seed	: 4.55	1.68	: 4.55	1.68	: 4.55	1.68
Fertilizer	: 1.80	4.50	: 1.80	4.50	: 1.80	4.50
Side dressing	: —	1.58	: —	1.58	: —	1.58
Bags	: 2.00	—	: 1.40	—	: 1.00	—
Picking and hauling peanuts	: 5.22	—	: 3.72	—	: 2.34	—
Baling and wire	: 1.40	—	: 1.10	—	: .70	—
Hauling to gin	: —	.37	: —	.27	: —	.18
Ginning, bags and ties	: —	2.45	: —	1.80	: —	1.20
Miscellaneous	: .20	1.00	: .20	1.00	: .20	1.00
Labor						
Pre-harvest man labor	: 4.20	6.30	: 4.20	6.30	: 4.20	6.30
Harvest man labor	: 6.20	8.44	: 5.60	6.30	: 5.00	4.20
Mule and equipment charge	: 8.60	8.40	: 8.60	8.40	: 8.60	8.40
Total	: 34.17	34.72	: 31.17	31.83	: 28.39	29.04
Returns for land, overhead and management 3/	: 34.50	25.46	: 17.93	12.58	: 2.72	.59

1/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 5 and 11.

2/ Based on average prices of 7.3 cents per pound for peanuts and 20 cents per pound for cotton.

3/ Represents the amount left over after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of product. Excludes land rent, management, and general overhead expenses.

Table 16.- Relative returns per acre for peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, southwest Georgia-southeast Alabama peanut area 1/

Soil groups and yields 2/	Peanuts: Cents per pound						
	.09	.08	.07	.06	.05	.04	
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
<u>Excellent</u> soils (870 lbs.)	49.29	40.59	31.89	23.19	14.49	5.79	
<u>Good</u> soils (620 lbs.)	28.47	22.27	16.07	9.87	3.67	- 2.53	
<u>Fair</u> soils (390 lbs.)	9.35	5.45	1.55	- 2.35	- 6.25	- 10.15	
Soil groups and yields 2/	Cotton: Cents per pound						
	.28	.25	.22	.19	.16	.13	
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
<u>Excellent</u> soils (245 lbs.)	45.06	37.71	30.36	23.01	15.66	8.31	
<u>Good</u> soils (180 lbs.)	26.98	21.58	16.18	10.78	5.38	- .02	
<u>Fair</u> soils (120 lbs.)	10.19	6.59	2.99	- .61	- 4.21	- 7.81	

1/ Returns to land, overhead, and management, with estimated usual yield for each group of soil.

2/ Soil grouping based on suitability for peanuts.

The size of farm varies considerably, ranging from small one-horse farms to plantation units. In 1943 more than one-fourth of the farm units were classified as large farms or plantations. These two groups of farms account for over half of the cropland in the area. Shifts to mechanical methods of production should be easier here than in some other parts of the South in view of the many plantations and large farms. At present, the usual farming system on most farms is based on the use of  $\frac{1}{2}$ -row or 1-row equipment. A considerable number of plantations and larger farmers have begun to shift to tractor power. The prospects for mechanization are discussed in the section dealing with increasing farm efficiency.

#### Southeastern Coastal Plain of Georgia

This area, sometimes referred to as the hogging-off section of Georgia, corresponds to the lower part of the Coastal Plain region of the State (Ga. 9, fig. 11). The peanut section of northern Florida is generally similar to this area. Practically all the cropland is classified as suitable for peanuts and more than three-fourths of the cropland

Table 17.- 1943 crop acreage and livestock numbers on peanut-cotton farms within four size groups, peanut-cotton type-of-farming areas of southwest Georgia and southeast Alabama <sup>1/</sup>

Item	Unit	Size of farm			
		Small	Medium	Large	Plantation
Range in size of cropland	: Acres :	15-59	60-109	110-189	190-499
Usual number of families per farm	: Number:	1	1-2	3-4	5 & over
Proportion of total operating units	: Percent:	38	29	15	12
Cropland	: Acres :	38.0	82.9	143.6	336.5
Specified crops, 1943	:	:	:	:	:
All corn	: Acres :	12.4	24.2	43.3	107.8
Cotton	: Acres :	6.2	12.4	24.2	51.2
Peanuts, grown alone	: Acres :	14.1	33.3	56.3	128.4
Peanuts, picked and threshed	: Acres :	(12.1)	(25.2)	(43.4)	(105.9)
Oats and wheat	: Acres :	1.5	1.1	3.2	8.9
Annual legumes	: Acres :	1.4	2.6	3.8	7.0
Livestock (January 1, 1944)	:	:	:	:	:
Horses and mules	: Number :	1.6	2.8	4.7	9.6
All cattle and calves	: Number :	2.6	5.6	9.1	28.2
Milk cows (2 years)	: Number :	1.4	2.8	3.8	8.4
Hens and pullets for laying	: Number :	32	50	69	140
All hogs and pigs	: Number :	10.6	20.2	35.3	78.9
Sows farrowing, 1943	:	:	:	:	:
Spring	: Number :	1.6	3.0	4.6	11.8
Fall	: Number :	1.6	3.0	5.2	10.9
Chickens raised	: Number :	58	100	124	142

<sup>1/</sup> Based on a 10 percent sample of 1943 farm plan sheet data in 10 representative counties in Georgia and Alabama areas.

is classified as excellent or good for peanuts. The soils of the southeastern Coastal Plain area of Georgia are largely of the Norfolk, Ruston and Tifton series but differ somewhat from soils in the old edible nut area in that more of them are sandy to a greater depth. Most of the better peanut soils here are more adapted to Runner peanuts than to Spanish varieties. <sup>14/</sup> But Runner peanuts have not found favor with the

<sup>14/</sup> "Peanut Production Possibilities in Georgia," by Hendrix, W. E., Butler, Charles P., and Goodman, K. V. Ga. Expt. Sta. and U. S. Dept. of Agr. Bul 228, 1943.

edible trade, and before the war they sold at considerably lower prices. This situation discouraged to some extent the digging of Runner peanuts for sale. Before the war cotton and tobacco were the chief cash crops and most of the peanuts were grown for hogging-off; they were either planted alone or interplanted with corn.

The war brought many substantial shifts in the farming of this area. Increased demands for peanuts and favorable prices made it more profitable for farmers to harvest Runner peanuts for sale. The acreage of harvested peanuts greatly expanded. Peanuts for digging are now one of the major cash enterprises. A substantial number of farmers, however, still do not grow peanuts for harvest particularly in the tobacco section. The increase in peanut acreage has been associated with a corresponding decrease in cotton acreage (table 18).

Table 18.- Size of farm, acreage of principal crops and associated data, southeastern Coastal Plain, Georgia, 1939-44 1/

Item	Acreage or number		Percentage of	
	per farm		cropland in	
	specified crops			
	1939	1944	1939	1944
All land in farms	115.2	115.3	—	—
Cropland harvested	44.5	37.8	100.0	100.0
Peanuts, grown alone	4.4	8.4	9.9	22.3
Peanuts, picked and threshed	(2.1)	(4.5)	(4.7)	(11.9)
Peanuts grown with other crops	(12.1)	(3.4)	(27.2)	(9.0)
Cotton	6.2	2.8	13.9	7.4
Corn (all purpose)	25.8	19.2	58.0	50.9
Oats threshed or fed	1.1	1.7	2.5	4.5
Tobacco	2.4	1.8	5.4	4.8
All hogs and pigs	10.8	13.6	—	—
Sows farrowing (spring)	1.8	1.8	—	—
Peanuts, picked and threshed				
acreage per farm growing	8.8	11.9	—	—
Peanut yield (pounds per acre)	558.7	755.7	—	—
Farms, number	33,805	36,422	—	—

1/ Based on U. S. Census.

On many farms the old practice of planting peanuts with corn has largely been supplanted by plantings of peanuts grown alone. The latter practice allows the farmer more latitude when deciding whether to harvest the nuts or to hog them off. The total acreage planted to corn has decreased slightly.

Relative returns from peanuts and cotton.- On soils suitable for their production, peanuts have been relatively more profitable than cotton during recent years in this area. This is due largely to the price relationship between the two commodities. The 1943 estimated average prices of 6.8 cents per pound for Runner peanuts and 20 cents per pound for cotton favored peanuts more than did the price relations in most prewar years. Although prices of both crops have advanced since that time, the relationship has remained about the same. Assuming usual yields and 1943 prices and costs returns to land, management and overhead per acre were 4 to 12 dollars greater for peanuts than for cotton (table 19).

The place of harvested peanuts in the future farming systems is less certain here than in the older peanut areas. With a price relationship of 5.5 cents per pound for Runner peanuts and 19 cents per pound for cotton the per acre returns to land, overhead and management would be lower for peanuts than for cotton except on the soils classified as excellent for peanuts (table 20).

If there is a continuation of present favorable price relations peanuts will have a definite place in the farm organization and the agriculture may shift somewhat further in the direction of a cash-crop economy. If prices should become considerably less favorable for peanuts, farmers may shift toward more cotton and hogged-off peanuts. But allotment controls are instituted limiting the acreage of cotton that can be grown, farmers may try to retain peanuts as a supplemental cash crop even though the price relationship is not very favorable.

Place of hogs in the farm organization.- Hog production is one of the major enterprises on farms in the southeastern Coastal Plain area. A considerable number of hogs are also produced in the Georgia-Alabama peanut area previously discussed, but the relative importance of hog production in that area has not been as great, and detailed discussion of the hog enterprise has therefore been reserved for this section of the report.

Probably the most usual method of production in the southeastern Coastal Plain area is to carry the hogs through the spring and summer on a maintenance ration of corn and range grazing. Sometimes special grazing crops are planted to help carry the pigs. Some buying and selling of feeder pigs takes place among these farmers as the season progresses and as the farmers are able to estimate their prospective feed supplies more accurately. When peanuts are ready for grazing the hogs are turned into the fields until they reach a finished weight, or until the feed supply is exhausted. The peanut-grazing season is too short to grow and fatten late-farrowed pigs. Consequently, many hogs are marketed at light

Table 19.- Relative returns per acre from cotton and runner peanuts on excellent, good and fair soils for peanuts, 1943 prices and usual yields, southeastern Coastal Plain, Georgia 1/

Item	A- :Excellent soils:		B-Good soils		C-Fair soils	
	Pea- :nuts	:Cotton	Pea- :nuts	:Cotton	Pea- :nuts	:Cotton
	:Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Gross value of crop <u>2/</u>						
Nuts or lint	61.20	46.00	44.54	37.00	26.52	22.00
Seed or hay	7.50	10.14	5.25	8.06	3.75	4.78
Total	68.70	56.14	49.79	45.06	30.27	26.78
Specified costs						
Seed	2.92	1.44	2.92	1.44	2.92	1.44
Fertilizer	1.68	4.50	1.68	4.50	1.68	4.50
Side dressing	--	1.02	--	1.02	--	1.02
Picking & hauling peanuts	5.40	--	3.93	--	2.34	--
Bags	2.00	--	1.42	--	.86	--
Baling & wire	1.70	--	1.20	--	.80	--
Hauling to gin	--	.34	--	.28	--	.16
Ginning bags and ties	--	2.30	--	1.85	--	1.10
Miscellaneous	.20	.50	.20	.50	.20	.50
Labor:						
Pre-harvest man labor	2.91	5.55	2.91	5.55	2.91	5.55
Harvest man labor	7.56	8.06	6.30	6.44	5.46	3.82
Mule and equipment charge	7.30	6.80	7.30	6.80	7.30	6.80
Total	31.67	30.51	27.86	28.38	24.47	24.89
Returns for land, overhead and management per acre <u>3/</u>	37.03	25.63	21.93	16.68	5.80	1.89

1/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 6 and 11.

2/ Based on average prices of 6.8 cents per pound for peanuts and 20 cents per pound for cotton.

3/ Represents the amount left over after deducting enterprise expenses and value of labor, power and equipment used in production from the gross value of product. Excludes land rent, management, and general overhead expenses.

Table 20.- Relative returns per acre for Runner peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, southeastern Coastal Plain, Georgia 1/

Soil groups and yields 2/	Peanuts: Cents per pound					
	:	:	:	:	:	:
	: .085	: .075	: .065	: .055	: .045	: .035
	:	:	:	:	:	:
	<u>:Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
	:	:	:	:	:	:
<u>Excellent</u> soils (900 lbs.)	: 52.33	43.33	34.33	25.33	16.33	7.33
<u>Good</u> soils (655 lbs.)	: 33.07	26.52	19.97	13.42	6.87	.32
<u>Fair</u> soils (390 lbs.)	: 12.43	8.53	4.65	.73	- 3.17	- 7.07
	:	:	:	:	:	:
Soil groups and yields 2/	Cotton: Cents per pound					
	:	:	:	:	:	:
	: .28	: .25	: .22	: .19	: .16	: .13
	:	:	:	:	:	:
	<u>:Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
	:	:	:	:	:	:
<u>Excellent</u> soils (230 lbs.)	: 44.03	37.13	30.23	23.33	16.43	9.53
<u>Good</u> soils (185 lbs.)	: 31.48	25.93	20.38	14.83	9.28	3.73
<u>Fair</u> soils (110 lbs.)	: 10.67	7.37	4.07	.77	- 2.53	- 5.83
	:	:	:	:	:	:

1/ Returns to land, overhead, and management, with estimated usual yields for each group of soil.

2/ Soil grouping based on suitability for peanuts.

weights or sold as feeders to farmers in other parts of the State. Some of the later farrowed pigs are carried through the winter to be fattened on the following year's crop of peanuts. Breeding stock, and pigs and shotes not sold are carried through the winter on crop aftermath and a maintenance ration of corn.

When hogs are grazed on peanuts the gains they make vary greatly from farm to farm, depending largely on the age and condition of the hogs, the kind and amount of supplemental minerals and proteins fed and the yields and conditions of the peanuts to be hogged. As has been said, the usual practice in this area is to feed a maintenance ration during the summer to hogs that are to be fattened on peanuts. Hogs that have been kept on this short ration for a longer period and hogs getting a ration shorter than the usual amount naturally will be less efficient in the use of the fattening ration when the grazing season comes. It follows that those hogs that receive a more adequate maintenance ration or a full ration will make heavier gains during the fattening period. From farm to farm this summer feeding practice naturally varies.

Mineral mixtures or protein supplements are necessary for the efficient utilization of peanuts as a hog feed. Experiments in Florida by Pace and Glasscock showed that hogs receiving a complete mineral

mixture produced 466 pounds of pork per acre of peanuts grazed, while those grazing peanuts alone produced only 258 pounds of pork per acre. Other experiments with protein supplements show similar results.

It is obvious that the yield of peanuts would influence the yield of pork, but the condition of the peanut crop also has influence. If the crop is grazed too early many young nuts that would otherwise mature would get lost. On the other hand, if the nuts are allowed to stand too long after maturity, they begin to deteriorate. There are definite time limits within which the crop should be grazed, for greatest efficiency.

Farmers in the area have generally found it profitable to depend on hogging-off peanuts for fattening hogs rather than rely entirely on corn production. However, considerable attention should be paid to developing systems of farming that will put the pigs on the peanuts in better shape, and that will provide needed supplemental minerals and proteins while on peanuts. The climatic conditions are favorable for the development of a series of grazing crops to provide feed during the other periods of the year. Southwell and Treanor 15/ in a series of experiments have found a number of grazing crops for use at different times of the year which seem to offer economical sources of feed for growing pigs. Included in these would be small grains for spring and summer grazing, early dent corn, Spanish peanuts for summer grazing, Runner peanuts for fall grazing, and sweetpotatoes for winter grazing.

Greater attention needs to be paid to disease control and breeding control.

The use of peanuts for hogging in some respects supplements the picked and threshed acreage in the farm organization. Hogged-off peanuts offer little conflict during the busy peanut and cotton harvesting periods. Furthermore, hogging-off peanuts is an effective means of increasing fertility. Experiments at the Alabama Wire Grass substation indicate that peanuts hogged-off increase the per-acre yield of the following cotton crop about as much as the application of 36 pounds of commercial nitrogen. 16/ Even where rather large acreages of nuts for digging are grown, suitable rotations can generally be worked out to include an acreage of hogged-off peanuts. The treatment of seed peanuts reduces dangers from soil-borne diseases where a minimum of rotation between peanuts and other crops is followed. Thus the acreage picked and threshed is generally the limiting factor in developing suitable rotations that will maintain yields. From the standpoint of soils it

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15/ "Hogging-off Crops in the Coastal Plain," by Southwell, B. L., and Treanor, K., Bul. 41, Ga. Coastal Plain Expt. Sta., 1945.

16/ "Effect of Digging and Hogging Peanuts on Cotton Yields," Ala. Expt. Sta. Leaflet 18, 1939.

it would therefore be possible to increase considerably the acreage hogged-off in the southeastern Coastal Plain without necessarily reducing the acreage picked and threshed. In an intensive peanut area, like the Georgia-Alabama peanut-cotton area, the picked and threshed acreage should be reduced, but it would appear possible to increase the acreage hogged-off somewhat and still maintain suitable crop rotations.

While the peanut hogging-off enterprise offers most of the farmers in this area an opportunity to balance their organization somewhat better, there are some limitations to the expansion of the enterprise. As peanuts usually provide only a 2- or 3-month grazing period, other feeds and grazing crops must be used to supplement the enterprise for the remaining months. Up to now this has been a major limitation in the area. Corn is the chief concentrate in the maintenance rations. The low yields of corn in this area (averaging only 10.9 bushels for the 1937-41 period) tends to reduce production efficiency of the hog enterprise. On the other hand, the efficiency of hog production in some other commercial hog areas, such as the Corn Belt, has increased considerably in recent years largely as a result of increased yields received from hybrid corn. Furthermore, the practice of grazing peanuts as the primary means of fattening hogs prevents the orderly system of marketing throughout the year as is done in the Corn Belt. Rather, it causes most of the hogs to be dumped on the market in a short period and when prices are normally low.

#### Other Areas in the Southeast

Production conditions in other parts of the southeastern Coastal Plain region are also well suited to peanuts. Considerable acreages have been grown in the Upper Coastal Plain of Georgia (Area 8, fig. 11) and the Coastal Plain of Florida (Area 13, fig. 11). Much of this acreage has been hogged-off. Soils in these two areas are mainly of the Norfolk, Ruston and Tifton series and conditions are generally similar to those found in the southeastern Coastal Plain area of Georgia.

Nearly 90 percent of the cropland in the Upper Coastal Plain area is classified as suitable for the crop and about three-fourths of it is in the best soil groups for peanuts. The estimated yields of peanuts represent an average of all types. Runner peanuts are grown extensively in the area, and make up a large proportion of the output. Cotton yields are somewhat higher than in the southeastern Coastal Plain or the old edible-nut areas so yield relationships are not generally so favorable as in these areas.

The production situation in the Florida Coastal Plain is in many respects similar to that found in the southeastern Coastal Plain of Georgia. Hogging-off is very prevalent and the total acreage grown alone, for all purposes, accounted for approximately one-third of the suitable cropland. About 15 percent of the suitable land was used for peanuts picked and threshed. Areas of low poorly-drained soils reduce the average proportion of suitable soils somewhat below the Georgia Coastal Plain areas.

Soils in Sandhills areas (Georgia Area 5 and Alabama Area 6, fig. 11) are predominantly of the Norfolk, Gilead, and Vaucluse series. In addition, the counties in these areas extend into the Piedmont. Commercial production of peanuts have attained some importance during the war in these areas, but soils are generally not so well suited as in the Coastal Plain areas.

Peanut acreage in South Carolina has never been extensive. Commercial production before the war was unimportant except in a few localities. About half of the peanut acreage in South Carolina is located in Area 3b(fig. 11). The soils here are well suited to peanuts and are also well suited to cotton and high yields from this established crop have tended to keep peanut acreage down.

Table 21 shows the actual 1943 yield of peanuts and usual yields of cotton by soil groups in Bamberg County, S. C., based on 178 peanut fields on 75 farms. Usual cotton yields reported by farmers on these soils were good. Perhaps partly as a result, many peanuts were planted on soils less well adapted to them.

Table 21.- Yield of peanuts in 1943 and usual yield of cotton per acre on fields classified according to suitability for producing peanuts, 75 farms, Bamberg County S. C. 1/

General :	:	:	:	Average proportion of field in			
suitability: 1943 :	Usual :	Number :	specified suitability groups				
of field : peanut :	cotton :	of :	Excel- :	:	:	:	
for : yield :	yield :	fields :	lent :	Good :	Fair :	Poor :	
peanuts 2/:	:	:	:	:	:	:	
:	Pounds		:				
:	Pounds	of lint	:	Percent	Percent	Percent	Percent
:	:	:	:	:	:	:	:
Excellent :	910	330	62	66	27	7	
Good :	600	330	61	25	49	24	2
Fair :	405	230	46	1	30	56	13
Poor :	275	195	9	---	---	25	75
:	:	:	:	:	:	:	:
:	:	:	:	:	:	:	:

1/ Adapted from S. C. Expt. Sta. Bul. 351. Based on data from 178 fields used for growing peanuts for digging. Suitability of field for peanuts determined by soil scientist after examining each field, yield data secured by interview with farm operator.

2/ The general suitability of the field was determined by the soil group or groups that predominate. The general field designation was determined by the soil group that predominates in that particular field. Fields classified generally excellent for peanuts, for example, have an average of 56 percent of their area in excellent soil types, 27 percent in good soil types, and 7 percent in fair soil types. Fields classified generally fair, on the other hand, have on the average 1 percent of their area in excellent, 30 percent in good, 56 percent in fair, and 13 percent in poor soil types.

Yields on these farms were somewhat above the average for the area as a whole. The data for the area is based on the average 1937-41 yield for entire production of the area, which would reflect average management and cultural practices. Poor practices, such as neglecting peanuts when cotton and peanuts call for attention at the same time, planting too late, or digging too long after maturity, are common in this area particularly among small or new producers. The farmers in the survey were somewhat above average in size of farm and ability, but many of the farmers used poor practices. Farmers who followed good practices obtained yields higher than those shown in table 21. <sup>17/</sup> In view of the relatively high yields of cotton future trends in acreage in this area must depend considerably on a general improvement in peanut yields.

### Oklahoma and Texas

Commercial production in the Southwestern area is concentrated almost entirely in Oklahoma and Texas. It is important in only a few isolated localities in Louisiana and Arkansas where it has been decreasing in recent years.

Before the war commercial production was limited primarily to the Rio Grande Plain and West Cross Timbers area in Texas and to Bryan County in the Coastal Plain of Oklahoma. Wartime demand brought rapid expansion in several other places. In 1943 the three areas accounted for only two-fifths of the total acreage picked and threshed in Oklahoma and Texas.

Considerable tracts of sandy soils suitable for peanuts are found in many parts of Texas and Oklahoma, but climatic and other conditions have restricted peanut production in several of them. Some peanuts are grown in the western parts of Texas and Oklahoma, but the prevailing moisture conditions have meant wide variations in the yields. Furthermore, peanut production brings the danger here of accelerated wind erosion which is a real threat to the future productivity of the land unless proper practices are followed. In the small-grain areas of northern Oklahoma the soils, type of farming, and climatic conditions are more favorable to other crops.

Wartime increases in peanut acreage have been limited mainly to the established peanut areas and to the sandy soils in the eastern and central parts of Oklahoma and Texas. Even after the wartime expansion the bulk of the commercial acreage was located in the six selected areas in Oklahoma and Texas: (1) Northeast Texas Sandy Lands; (2) Cross Timbers, Oklahoma; (3) West Cross Timbers, Texas; (4) Rio Grande Plain, Texas; (5) Oklahoma Coastal Plain; and (6) Ouachita Highlands, Oklahoma.

<sup>17/</sup> Usual yields obtained by farmers following good cultural practices for peanuts were estimated as follows: Excellent fields 1,260 pounds, good fields 970 pounds, fair fields 570 pounds, poor fields 410 pounds.

The West Cross Timbers and Rio Grande Plain remain as the largest commercial peanut-producing areas in the Southwest. Both are located in the subhumid region. The average annual rainfall is from 20 to 30 inches.

### Northeast Texas Sandy Lands Area

This area is located in the extreme northeastern corner of Texas (Texas 15, fig. 11). The agriculture in most respects is typical of a considerably larger area, comprising the sandy land portions of adjoining counties and similar areas in Oklahoma, Louisiana, and Arkansas. The upland soils are sandy and only moderately productive. Heavier alluvial soils are found along the streams: if not subject to overflow they give good yields of adapted crops. The rainfall averages between 40 and 45 inches annually.

The agriculture is characterized by small farms, irregular-shaped fields, and simple tools. The basic cropping system centers around cotton and corn, supplemented in parts of the area by many special crops, including vegetables, small fruits, and nursery plants. Other crops that are common throughout the area are cowpeas, sorghum, sweetpotatoes, and watermelons.

A substantial acreage of soils suitable for peanuts is located in the northeast Texas Sandy Lands. The soils in the excellent and good groups, however, are somewhat scattered and small and they are surrounded by fairly large tracts of thin and eroded or otherwise unsuitable soils. For this reason, the producing units are small, with rarely more than 5 or 10 acres in a field, and the area as a whole is less desirable than areas with larger bodies of soil but with much less total acreage of excellent land.

Farmers have been inclined to plant peanuts on land not well adapted to other crops and this has meant peanuts on the poorer soils (table 22).

Table 22.- Number of farms and yields of peanuts per acre by soil-suitability groups, Smith County, Tex., 1943

Soil suitability group 1/	: Number of farms :	Number of acres:	Average yield
<u>Excellent</u>	: ---	---	---
<u>Good</u>	: 12	134	514
<u>Fair</u>	: 33	324	288
<u>Poor</u>	: 5	49	178

1/ Based on suitability for peanuts. Classification of lands used for peanuts based on predominate group or groups of soils occurring in the field.

Peanut production methods in this area resemble those in the Southeast in that acreages are small, power and equipment units are small, and much hand labor is used in digging and stacking. Yields, however, are lower than in the Southeast both absolutely and in relation to cotton.

Wartime conditions saw a marked decrease in the acreage of harvested crops in the Northeast Sandy Lands. Considerable cropland was abandoned or allowed to remain idle (table 23). This was partly because of shortages of farm labor and partly because of possible off-farm work for the farmer

Table 23.- Size of farm, acreage of principal crops and associated data, northeast Texas Sandy Lands, 1939-44 <sup>1/</sup>

Item	: Acreage or number : : per farm		: Percentage of : cropland in : specified crops	
	: 1939	: 1944	: 1939	: 1944
All land in farms	: 94.6	102.2	--	--
Cropland harvested	: 30.3	21.2	100.0	100.0
Corn (all purpose)	: 10.2	6.9	33.7	32.5
Cotton	: 11.3	6.4	37.3	30.2
Sorghum	: 1.2	1.5	4.0	7.1
Cowpeas, grown alone	: 3.6	2.0	11.9	9.4
Peanuts, grown alone	: 0.9	1.1	3.0	5.2
Peanuts, picked and threshed	: (0.3)	(0.7)	(1.0)	(3.3)
Sweetpotatoes	: 0.4	0.7	1.3	3.3
Fresh vegetables (includes beans, tomatoes, other fresh vegetables)	: 0.5	0.9	1.6	4.2
Peanuts, picked and threshed	: 2.2	7.5	--	--
acreage per farm growing	: 331.8	390.8	--	--
Peanut yield (pounds per acre)	: 77,309	68,117	--	--
Farms, number	: 77,309	68,117	--	--

<sup>1/</sup> Based on the U. S. Census.

or members of his family. Acreages of cotton and corn have been substantially reduced although the two crops still account for over 60 percent of the harvested crop acreage. Special crops - such as peanuts, sweetpotatoes, and fresh vegetables - have expanded and, together, accounted for approximately one-eighth of the harvested cropland in 1944.

Before the war some peanuts were grown by a considerable number of farmers in the area. The 1939 census shows that approximately 15 percent of the farms reported growing peanuts. Some were grown in every county but the acreage per farm reporting was small, averaging only 2.2 acres. With the small acreage per farm, the principal uses were food for the family and feed for the livestock. A small quantity was marketed.

A common method of harvesting involved pulling or plowing out and stacking the vines around poles, where the nuts remained until they were fed or stored in barns. Another was to bunch into small piles for curing and hauling them to the barn soon after they were cured. Nuts for home use, for feed, and for limited sale usually were picked off by hand, as there were few mechanical pickers in the area.

Farmers in the northeast Texas Sandy Lands increased peanut acreage in response to war needs. The 1943 crop was estimated at about 120,000 acres picked and threshed, or more than double the acreage reported in the 1939 census. Since that time acreages have been reduced. In 1945 an estimated 98,000 acres of peanuts were picked and threshed.

With the rapid expansion, problems in production and marketing were encountered, particularly in 1942 and 1943. They may be attributed mainly to the small volume of production per farm. Many farmers planted only 5 to 6 acres, and these small acreages were frequently widely scattered within farm communities. The acreage per farm was not enough to permit the effective use of the available peanut pickers. Scattered production meant insufficient volume to warrant the establishment of assembly and marketing facilities at local points. However, the one-row and part-row horse-drawn implements with which most farms are now equipped make it impracticable to expect a substantially larger volume of production per farm without a heavy outlay for larger machinery.

Relative returns from peanuts and alternative crops.- A record of peanut production practices and returns, as well as comparable information for other crops, was obtained in 1943 from selected farmers. This material furnished the basis for the discussion and presentation of comparative data.

Sweetpotatoes and tomatoes have been commercially important in certain counties in the area for many years. The counties having the largest commercial acreage of sweetpotatoes include Camp, Smith, and Upshur. Commercial production of potatoes centers in Cherokee and Smith Counties, where market outlets have been well established. Returns per acre from these crops generally have been greater than from other crops, and the unusually high prices received during the war meant particularly large returns, even though the cash costs and labor requirements were much greater. In 1943 returns per acre to land and management from sweetpotatoes were more than three times the returns from cotton, and more than five times the returns from peanuts. <sup>18/</sup> Returns per acre to land and management from tomatoes were even larger. Sweetpotatoes and tomatoes are usually grown on family-sized farms. But the volume of production which can be absorbed at favorable prices by a market which is extremely sensitive to seasonal surpluses is rather small in normal times.

Cotton remains the dominant crop throughout the area. Almost every farmer who grows peanuts also grows a substantial acreage of cotton. Yields of cotton are not high and production efficiency is lower than in

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<sup>18/</sup> Based on unpublished data, U. S. Dept. of Agr., Bur. Agr. Economics.

many areas, but there is a lack of adapted alternative crops that can be produced and marketed by a large number of farmers.

Per acre returns from peanuts and cotton with usual yields on the various soil groups indicate that, even with 1943 prices and costs, cotton is the more profitable except on soils classified as excellent for peanuts (table 24). The per-acre returns to land, overhead, and management on

Table 24.- Relative returns per acre from peanuts and cotton on excellent, good and fair soils for peanuts, 1943 prices and usual yields, northeast Texas Sandy Lands area 1/

Item	: A- <u>excellent</u> : <u>soils</u>		: B- <u>good</u> soils		: C- <u>fair</u> soils	
	: Peanuts	: Cotton	: Peanuts	: Cotton	: Peanuts	: Cotton
	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars	: Dollars
Gross value of crop 2/	:	:	:	:	:	:
Nuts or lint	: 45.56	39.00	30.94	34.12	18.36	19.50
Seed or hay	: 12.00	8.58	9.00	7.54	6.00	4.26
Total	: 57.56	47.58	39.94	41.66	24.36	23.76
Specified costs	:	:	:	:	:	:
Seed	: 3.35	2.25	3.35	2.25	3.35	2.25
Picking and hauling peanuts	: 5.02		3.41		2.02	
Bags	: 1.32		.90		.54	
Baling and wire	: 3.00		2.25		1.50	
Hauling to gin	:	.40		.35		.20
Ginning, bags and ties	: 2.50			2.19		1.25
Miscellaneous	: .20	.55	.20	.55	.20	.55
Preharvest man labor	: 5.28	7.60	5.28	7.60	5.28	7.60
Harvest man labor	: 7.50	7.95	5.50	6.98	5.75	3.96
Mule and equipment charge	: 7.00	7.00	7.00	7.00	7.00	7.00
	: 32.67	28.25	28.89	26.92	25.64	22.81
Returns for land, overhead and management 3/	: 24.89	19.33	11.05	14.74	- 1.28	.95

1/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 7 and 11.

2/ Based on acreage prices of 6.8 cents per pound of peanuts and 19.5 cents per pound of cotton.

3/ Represents the amount left over after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of product. Excludes land rent, management, and general overhead expenses.

excellent soils are more than \$5 per acre higher than from cotton on the excellent soils. However, these soils are widely scattered and generally occur in small patches mixed with other less desirable types of soils.

These soils are also well adapted to cotton. Farmers have been reluctant to use their better soils for peanuts as they have not been adopted as a major cash enterprise in this area. With less favorable prices for peanuts cotton would compete with peanuts even on the excellent soils for peanuts (table 25).

Table 25.- Relative returns per acre for peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, northeast Texas Sandy Lands Area 1/

Soil groups and yields 2/	Peanuts: Cents per pound					
	.09	.08	.07	.06	.05	.04
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
<u>Excellent</u> soils (670 pounds)	39.63	32.93	26.23	19.53	12.83	6.13
<u>Good</u> soils (455 pounds)	21.06	16.51	11.96	7.41	2.86	- 1.69
<u>Fair</u> soils (270 pounds)	4.66	1.96	-.74	- 3.44	- 6.14	- 8.84
Soil groups and yields 2/	Cotton: Cents per pound					
	.28	.25	.22	.19	.16	.13
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
<u>Excellent</u> soils (200 pounds)	36.33	30.33	24.33	18.33	12.33	6.33
<u>Good</u> soils (175 pounds)	29.61	24.36	19.11	13.86	8.61	3.36
<u>Fair</u> soils (100 pounds)	9.45	6.45	3.45	.45	- 2.55	- 5.55

1/ Returns to land, overhead, and management with estimated usual yields for each group of soil.

2/ Soil grouping based on suitability for peanuts.

Peanuts in the farm organization after the war.- A majority of the farmers producing peanuts in east Texas use part-row and one-row horse-drawn equipment, although some have turned to tractor power (table 26).

The continuation of a relatively high acreage of peanuts in this area after the war will depend mainly upon the relation between prices for peanuts and prices for competing crops, and the extent to which technological improvements can be adopted. More tractors and other labor-saving equipment would improve the competitive position of peanuts and probably some other crops as well. Pick-up attachments on threshers or combines would be adapted to only a few large farms that have big fields.

Land resources per farm and per man in this area are so limited that reasonable returns to labor and investment cannot be obtained. Farms need to be enlarged by combining units. Larger farms are necessary before

Table 26.- Number of farms, cropland, acreage, and percentage of cropland for selected crops in Smith County, Tex., classified by kind of equipment used, 1943

Item	Level of equipment 1/		
	Half-row horse	One-row horse	One-row tractor
Number of farms	28	14	9
Acreage per farm:			
Cropland	62.0	98.9	105.3
Peanuts	6.7	7.8	22.9
Cotton	9.2	19.9	22.8
Corn	11.2	21.8	19.2
Idle and abandoned cropland	24.1	31.6	16.3
Percent of cropland:			
Peanuts	10.8	7.9	21.7
Cotton	14.8	20.1	21.6
Corn	18.1	22.0	18.3
Idle	38.9	31.9	15.5

1/ Based on kind of equipment used in cultivation.

general benefits can be expected from technological improvements. A reduction in farm population would mean larger returns for those remaining. With large farms would come greater dependence on more extensive enterprises, such as livestock and farm forestry, as sources of income. With good management farmers on the more productive small farms can improve their incomes by concentrating on producing such specialty crops as tomatoes, sweetpotatoes, watermelons, and berries.

#### Cross Timbers of Oklahoma

The Cross Timbers of Oklahoma are sometimes divided into three type-of-farming areas (Okla. 7, 8 and 15, fig. 11). The sandy soils used for peanuts are similar throughout the area. These soils are, in general, similar to those of the West Cross Timbers area of Texas, but for the most part have a somewhat higher rainfall. This partially accounts for the generally higher yields in the Oklahoma areas. Another factor of some importance in explaining the higher relative yields is the occurrence of more suitable prairie and alluvial soils of relatively high productivity. Yields of both cotton and peanuts are higher in the Oklahoma area. Peanut yields are somewhat less favorable relative to cotton than in the West.

In terms of total acreage and production the Cross Timbers is the leading peanut-producing section in Oklahoma, but the proportion of the cropland used for the crop is small. Considerable areas of included prairie soils not suitable for peanuts are found. Approximately two-fifths

of the cropland is classified as good or excellent for peanuts and present acreages are equivalent to only one-eighth of this acreage.

The Cross Timbers of Oklahoma includes a wide diversity of physical conditions. This has given rise to a considerable variety of the size and type of farms and in the crops grown. On some farms where soils are not well suited to crops, the system of farming is based largely on livestock. Although operating units vary from small part-time units to large cattle ranches, about half of the farms are between 70 and 180 acres and include nearly one-half of the cropland. Approximately one-fifth of the harvested cropland in the area is devoted to small grains (table 27). These crops are grown largely in the included prairie sections rather than on the sandy soils.

Table 27.- Size of farm, acreage of principal crops and associated data, Oklahoma Cross Timbers, 1939-44 <sup>1/</sup>

Item	: Acreage per farm :		: Percentage of cropland in specified crops :	
	: 1939 : 1944 :		: 1939 : 1944 :	
All land in farms	: 147.1	166.5	—	—
Cropland harvested	: 45.8	45.4	100.0	100.0
Cotton	: 7.4	6.6	16.2	14.5
Corn (all purpose)	: 11.1	10.6	24.2	23.3
Sorghum	: 5.1	7.1	11.1	15.6
Oats, threshed or fed	: 6.9	6.5	15.1	14.3
Cowpeas, grown alone	: 1.7	0.4	3.7	0.9
Peanuts, grown alone	: 0.5	1.8	1.1	4.0
Peanuts, picked and threshed	: (0.3)	(1.5)	(0.7)	(3.3)
Barley	: 1.7	0.4	3.7	0.9
Wheat	: 4.0	4.0	8.7	8.8
Peanuts, picked and threshed acreage per farm growing	: 5.5	12.3	—	—
Peanut yield (pounds per acre)	: 391.4	477.0	—	—
Farms, number	: 43,549	40,166	—	—

<sup>1/</sup> Based on the U. S. Census.

Cotton and corn are the dominant crops in the sandy areas. Peanuts are limited mostly to the sandier soils. Although the total acreage of peanuts is larger here than in any other area in Oklahoma the acreage per farm is small, averaging less than 2 acres. But on farms where they are grown, peanuts now represent an important enterprise. The peanut acreage per farm growing averaged over 12 acres in 1944. On farms where this enterprise has been increased, the expansion in acreage has been made possible largely by increasing the acreage of harvested crops and reducing cotton acreage.

Relative returns from cotton and peanuts.- Per-acre returns favor peanuts on excellent and good soils, assuming usual yields and 1943 price and cost relations (table 28). However, the per-acre returns for land, overhead, and management on soils classified as fair for peanuts decidedly favor cotton production even under the favorable 1943 price situation, so it appears that peanuts should be limited to the better soils in the Cross Timbers area.

Table 28.- Relative returns per acre from peanuts and cotton on excellent, good and fair soils, 1943 prices and usual yields, Oklahoma Cross Timbers 1/

Item	A-Excellent soils		B-Good soils		C-Fair soils	
	Peanuts	Cotton	Peanuts	Cotton	Peanuts	Cotton
	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
Gross value of crop <u>2/</u>						
Nuts or lint	48.96	37.00	36.04	27.75	19.72	23.12
Seed or hay	12.00	9.00	9.60	6.75	6.00	5.60
Total	60.96	46.00	45.64	34.50	25.72	28.72
Specified costs						
Seed	3.48	2.00	3.48	2.00	3.48	2.00
Picking and baling peanuts	5.04	--	3.71	--	2.03	--
Bags	1.80	--	1.32	--	.72	--
Baling and wire	2.20	--	1.76	--	1.10	--
Hauling to gin	--	.40	--	.30	--	.25
Ginning, bags and ties	--	2.70	--	2.02	--	1.69
Miscellaneous	.20	.25	.20	.25	.20	.25
Pre-harvest man labor	4.70	5.80	4.70	5.80	4.70	5.80
Harvest man labor	9.60	9.52	8.40	7.14	7.20	5.93
Mule and equipment charge	8.40	6.80	8.40	6.80	8.40	6.80
Total	35.42	27.47	31.97	24.31	27.83	22.72
Returns for land, overhead and management <u>3/</u>	25.24	18.53	13.67	10.19	2.11	6.00

1/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 8 and 11.

2/ Based on average prices of 6.8 cents per pound for peanuts and 18.5 cents per pound for cotton.

3/ Represents the amount left over after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of product. Excludes land rent, management, and general overhead expenses.

The estimates of costs and returns are based on the prevailing methods of production, using mule power and associated production methods. Labor requirements per acre are about the same, both crops requiring large

amounts of hand labor. During the war, however, some farms have greatly mechanized peanut production thus reducing the hand labor materially, particularly in the harvesting operations. In a few instances production has been almost completely mechanized, planting and cultivating with tractor power and harvesting with a side-delivery rake and a combine. The future of peanut production in this area must depend largely on the extent to which mechanized practices (which will increase efficiency) can be adopted. If mechanized methods come into general use, considerable changes in farming systems can be expected. Both the climate and the prevailing size of farm appear somewhat more favorable for such developments in this area than in the Northeast Texas Sandy Lands or other areas of eastern Oklahoma.

With present prevailing practices, however, a relatively small shift in the price relationship in favor of cotton would be likely to wipe out the advantage held by peanuts on the basis of per-acre returns. For example, with prices at 6 cents a pound for peanuts and 19 cents a pound for cotton, returns from the two crops would tend to be equalized on the excellent soils and cotton would have an advantage on the good and fair soils (table 29).

Table 29.- Relative returns per acre for peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, Oklahoma Cross Timbers 1/

Soil groups and yields 2/	Peanuts: Price per pound					
	.09	.08	.07	.06	.05	.04
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
<u>Excellent</u> soils (720 lbs.)	41.08	33.88	26.68	19.48	12.28	5.08
<u>Good</u> soils (530 lbs.)	25.33	20.03	14.73	9.43	4.13	- 1.17
<u>Fair</u> soils (290 lbs.)	4.27	1.37	- 1.53	- 4.43	- 7.33	-10.23
Soil groups and yields 2/	Cotton: Price per pound					
	.28	.25	.22	.19	.16	.13
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
<u>Excellent</u> soils (200 lbs.)	37.43	31.53	25.53	19.53	13.53	7.53
<u>Good</u> soils (150 lbs.)	24.44	19.94	15.44	10.94	6.44	1.94
<u>Fair</u> soils (125 lbs.)	17.88	14.13	10.38	6.63	2.88	- .87

1/ Returns to land, overhead, and management with estimated usual yields for each group of soil.

2/ Soil grouping based on suitability for peanuts.

# West Cross Timbers Area of Texas

The West Cross Timbers area of Texas is the most important area of commercial peanut production in the western part of the belt (Texas 12, fig. 11). The agriculture there has changed greatly in the past 30 years. In 1914, cotton occupied about two-thirds of the cropland and was the chief source of cash income; but its production has declined and the annual output is now less than 10 percent of the 1910-14 average. People living there explain the marked reduction in acreage in terms of reduced yields. Insect damage, low inherent soil fertility, and soil erosion have reduced them.

Peanuts have almost completely replaced cotton on the sandy soils and now are the principal cash crop of the area. Climate, topography, and farm sizes in the area have all been favorable to mechanization of their production. Mechanization has proceeded so rapidly that now most of the farms are highly mechanized in the production of this crop. Tractor power is used widely also in growing cotton, but harvesting that crop is still mostly a job of hand labor.

The Census figures shown in table 30 include a considerable number of livestock farms and ranches located on the included prairie soils and rougher land. Most of the land on these farms is devoted to pasture and feed crops. Peanut farms, on the other hand, usually contain larger

Table 30.- Size of farm, acreage of principal crops and associated data, West Cross Timbers, Texas  
1939-44 <sup>1/</sup>

Item	: Acreage or number :		Percentage of	
	: per farm :		cropland in	
	: 1939 : 1944 :		specified crops	
			1939	1944
All land in farms	208.8	223.0	--	--
Cropland harvested	47.3	45.7	100.0	100.0
Corn (all purpose)	8.9	7.8	18.8	17.1
Sorghum	7.7	9.7	16.3	21.2
Wheat	2.1	2.4	4.4	5.3
Oats, threshed or fed	8.1	4.6	17.1	10.1
Peanuts, grown alone	6.8	12.0	14.4	26.3
Peanuts, picked and threshed	(6.5)	(11.9)	(13.7)	(26.0)
Cotton	4.1	2.7	8.7	5.9
Peanuts, picked and threshed, acreage per farm growing	24.2	37.6	--	--
Peanut yield (pounds per acre)	440.5	557.3	--	--
Farms, number	18,613	17,473	--	--

<sup>1/</sup> Based on U. S. Census.

acreages of cropland and cash crops than is true of the area as a whole. A somewhat better picture of the situation on peanut farms is given from records of the cropland organization of farmers in the area included in a study by the Texas Experiment Station. The 1943 cropland organization on these farms is shown for three size groups (table 31). The larger farms have a very high proportion of their land in peanuts, amounting to approximately one-half of the cropland on the 100-169 acre group. The smaller farms have a somewhat larger proportion of cotton, truck, and miscellaneous crops. The extremely high acreage of peanuts on the larger farms has probably been encouraged by their mechanized methods of production. Small farmers often must depend on custom work or rely on hand methods, particularly in the shaking and picking operations.

Table 31.- Farm organization by selected size groups,  
West Cross Timbers, Texas, 1943

Item	Size of farm <sup>1/</sup>		
	Small	Medium	Large
Total acres	130.3	165.0	273.3
Cropland <sup>3/</sup>	51.7	84.7	132.0
Peanuts	16.1	36.6	72.1
Cotton	2.3	2.5	3.2
Corn	12.9	7.7	13.9
Small grains	3.3	3.2	2.0
Grain sorghums	1.1	4.6	6.7
Sorghum bundles	2.5	1.8	5.2
Sudan pasture and hay	.6	3.6	4.0
Truck crops and miscellaneous	7.3	9.6	10.6
All other crops	3.7	12.1	5.3
Idle cropland	5.4	5.2	11.7

<sup>1/</sup> Compiled from record books kept by farmers cooperating with Texas Experiment Station.

<sup>2/</sup> Based on acres of cropland grouped as follows: 10-69, acres, 70-99 acres, 100-159 acres.

<sup>3/</sup> Total acres of crops slightly more than cropland acreage because of double cropping.

The soils of the West Cross Timbers area are not very homogeneous. Considerable rough shallow stony soils are found in some parts and are used primarily for grazing. Included within this area are small bodies of prairie soils ranging up to several hundred acres in size. These soils are generally too heavy to be well suited for peanuts and are used mainly for feed crops and pasture. The sandy soils used for peanuts are largely

brown acid fine sandy loam, low in organic matter and in some essential nutrients. They are of low to moderate inherent fertility and have sandy clay subsoils. More than 80 percent of the land is in farms, but only approximately one-fourth of the farm land is cultivated.

In 1943 the peanut acreage represented 38 percent of the good and excellent soils for peanuts. The wartime peak was almost double the prewar acreage. The reduction in acreage since that time is attributable in part to the fact that desirable crop rotations would not permit continued production at the 1943 level.

Normal yields of cotton are now very low. Estimated yields on the best soils for peanuts amounted to only 105 pounds of lint cotton per acre, compared with a yield of 585 pounds for peanuts. Yields of both cotton and peanuts are very low on the soils classified as fair for peanuts.

Relative returns from peanuts and cotton.- With the mechanized methods commonly used in this area, cotton offers but little competition to peanuts from the standpoint of relative returns. With usual yields and 1943 prices and costs, peanuts would return from \$4 to \$18 more per acre than cotton, depending on the suitability of the soil for peanuts (table 32). Returns are particularly favorable to peanut production on soils classified as good and excellent for peanuts.

Even with peanuts at 6 cents a pound and cotton as high as 28 cents a pound, returns from peanuts are higher than from cotton on those soils classified as good and excellent for peanut production (table 33). On farms using horse- or mule-power and hand methods, the relative advantage of peanuts in comparison with cotton is considerably less.

The productive condition of the soil is probably as important as the type of soil in this area. Planting land continuously to peanuts or in short rotations will quickly reduce the fertility of the soil. Yields of peanuts may continue to be favorable relative to other crops, but eventually the land may become temporarily worthless for crop production.

Historical trends in the abandonment of cropland in this area have demonstrated the dangers of soil erosion and loss of fertility when a higher percentage of the land is planted in peanuts or other row crops, without adequate safeguards. If present cropland acreages are to be maintained, increased emphasis must be placed on developing suitable rotations and conservation practices to check water and wind erosion and the loss of soil fertility.

Table 32.- Relative returns per acre from peanuts and cotton on excellent, good, and fair soils for peanuts, 1943 prices and usual yields, tractor-operated farms, West Cross Timbers area, Texas 1/ 2/

Item	: A-Excellent : soils		: B-Good soils		: C-Fair soils	
	: Peanuts: Cotton		: Peanuts: Cotton		: Peanuts: Cotton	
	: Dollars		: Dollars		: Dollars	
Gross value of crop 3/						
Nuts or lint	: 39.78	19.42	: 31.96	16.65	: 18.70	13.88
Seed or hay	: 7.20	4.26	: 6.60	3.64	: 6.00	5.12
Total	: 46.98	23.68	: 38.56	20.29	: 24.70	17.00
Specified costs						
Seed	: 3.02	.80	: 3.02	.80	: 3.02	.80
Picking and hauling peanuts	: 2.92	--	: 2.35	--	: 1.38	--
Bags	: 1.18	--	: .94	--	: .55	--
Baling and wire	: 1.32	--	: 1.21	--	: 1.10	--
Hauling to gin	: --	.35	: --	.30	: --	.25
Ginning, bags and ties	: --	1.05	: --	.90	: --	.75
Miscellaneous	: .20	.50	: .20	.50	: .20	.50
Preharvest man labor	: 2.20	3.02	: 2.20	3.02	: 2.20	3.02
Harvest man labor	: 3.38	4.98	: 3.00	4.26	: 2.62	3.61
Mule and equipment charge:	: .66	--	: .66	--	: .66	--
Tractor and equipment charge	: 4.20	3.96	: 4.20	3.96	: 4.20	3.96
Total	: 19.08	14.66	: 17.78	13.74	: 15.93	12.89
Returns for land, over- head, and management 4/	: 27.90	9.02	: 20.78	6.55	: 8.77	4.11

1/ Based on tractor power with mechanized harvesting, as most peanut production in this area appears to be so handled, although a number of farmers continue to use horse power and hand methods of harvesting.

2/ For physical requirements and 1943 costs of materials and services used in peanut and cotton production in this area see appendix tables 9 and 11.

3/ Based on average prices of 6.8 cents a pound for peanuts and 18.5 cents a pound for cotton.

4/ Represents the amount left over after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of the product. Excludes land rent, management, and general overhead expenses.

Table 33.- Relative returns per acre for peanuts and cotton with varying prices on excellent, good, and fair soils for peanuts, West Cross Timbers Area, Texas 1/

Soil groups and yields 2/	Peanuts: Price per pound						
	:	:	:	:	:	:	:
	: .09 :	: .08 :	: .07 :	: .06 :	: .05 :	: .04 :	: .03
	: dol- :	: dol- :	: dol- :	: dol- :	: dol- :	: dol- :	: dol-
	: lars :	: lars :	: lars :	: lars :	: lars :	: lars :	: lars
<u>Excellent</u> soils (585 lbs.)	: 40.77	: 34.92	: 29.07	: 23.22	: 17.37	: 11.52	: 5.67
<u>Good</u> soils (470 lbs.)	: 31.12	: 26.42	: 21.72	: 17.02	: 12.32	: 7.62	: 2.92
<u>Fair</u> soils (275 lbs.)	: 14.82	: 12.07	: 9.32	: 6.57	: 3.82	: 1.07	: -1.68
Soil groups and yields 2/	Cotton: Price per pound						
	:	:	:	:	:	:	:
	: .28 :	: .25 :	: .22 :	: .19 :	: .16 :	: .13 :	: .10
	: dol- :	: dol- :	: dol- :	: dol- :	: dol- :	: dol- :	: dol-
	: lars :	: lars :	: lars :	: lars :	: lars :	: lars :	: lars
<u>Excellent</u> soils (105 lbs.)	: 18.99	: 15.84	: 12.69	: 9.54	: 6.39	: 3.24	: .09
<u>Good</u> soils (90 lbs.)	: 15.10	: 12.40	: 9.70	: 7.00	: 4.30	: 1.60	: -1.10
<u>Fair</u> soils (75 lbs.)	: 11.24	: 8.99	: 6.74	: 4.49	: 2.24	: - .01	: -2.26

1/ Returns to land, overhead, and management with estimated usual yields for each soil group.

2/ Soil grouping based on suitability for peanuts.

#### Rio Grande Plain Peanut Area

The Rio Grande Plain peanut area represents a small part of the large type-of-farming area delineated as the Rio Grande Plain area (Texas 8, fig. 11). The agriculture of the western part of the Rio Grande Plain area consists primarily of livestock farming and cattle ranching. The peanut area is located in the eastern part of the broader area and includes most of the counties of Frio and Atascosa and parts of the counties of Medina, Lasalle and Wilson.

A wide diversity of products characterizes the agriculture of the peanut area. Livestock farming and cattle ranching are of some importance. Peanuts, grain sorghums, corn, watermelons, and truck crops are among the more important crops. Cotton yields are low and the crop is rapidly declining in the peanut area.

Cropland acreages per farm are large and crop production has been highly mechanized. This is particularly true of grain sorghums and peanuts.

The area is second only to the West Cross Timbers as the leading peanut area in Texas. Production has expanded rapidly and is now more

than three times the 1939 acreage. This rapid expansion has generally brought the peanut acreage near to the limits of physical capacity, and in the older sections peanuts appear to be expanded beyond the acreage that can be grown if soils are to be maintained.

The Rio Grande Plain area represents a section of southwestern extension of the Coastal Plain Provinces. The topography is mainly smoothly undulating to gently rolling, but nearly level over large areas. Much of the subregion is used for grazing except for localities where irrigation is practiced. The Duval and Webb soils are predominant in the eastern part where most of the farming is carried on. These soils are mostly of fine sandy loam and loamy fine sand textures. The soils are moderately to rather highly productive and are well suited to many crops including vegetables and truck crops. Sorghums and corn are the principal feed crops; they are quite successful. This area is very well adapted to peanuts and contains large bodies of suitable soils. The climate, topography, and location of suitable soils are all favorable to mechanized production of peanuts.

The crop has continued to increase throughout the war. The proportion of suitable soils used for it in 1943 was not so high as in the West Cross Timbers, but some of these soils are not used for peanuts because of the rainfall limitations in the western part of the area. In adapted areas peanut production has approached the level beyond which desirable soil-management practices will permit no increase.

Cotton is now relatively unimportant on soils suitable to peanuts and no yield estimates were made for cotton in table 9. This area is generally considered a marginal cotton area and acreages have been declining for several years. Yields are low, averaging only 87 pounds of lint for the 1937-41 period in the area as a whole.

Principal alternative crops on soils adapted to peanuts include truck crops, grain sorghums, and other feed crops. Although yields of peanuts are not high, methods of production are efficient and the enterprise has proven relatively profitable. Table 34 shows the yield of peanuts obtained by farmers in Frio County in 1943 on various groups of soils. Most of the peanuts were raised on fields classified as good. Often these fields contained some excellent and fair soils as well. None of the farms were classified as poor for peanuts although a limited amount of poor soils were used for peanuts where the soils of a field were mixed. In general, the large bodies of suitable soils for peanuts has enabled farmers to use good land selection.

Peanut acreages on the farms surveyed in Frio County were large, averaging over 100 acres per farm. Extensive production is possible because of the mechanization in digging and harvesting operations.

Table 35 shows the cropland organization of peanut farms surveyed in Frio County in connection with this study. Frio County was selected as being most representative of the Rio Grande Plain peanut area. The

Table 34.- Yields of peanuts in 1943 on farms classified according to soil suitability for peanuts - 42 farms, Frio County, Texas

Soil suitability group <u>1/</u>	Number of farms	Peanut acreage	Average yield
<u>Excellent</u>	9	1,186	693
<u>Good</u>	27	3,867	464
<u>Fair</u>	6	781	282

1/ Based on suitability of soil for peanuts. Classification based on soil group or groups which predominate on fields used for peanuts.

Table 35.- Percentage of cropland in various crops, selected farms, Frio County, Texas, 1943

Land use	Percent	Land use	Percent
Peanuts	41.2	Oats	1.4
Corn	10.6	Cowpeas	2.0
Grain sorghums	7.6	Rotation pasture	23.5
Forage sorghums	3.7	Cotton & miscellaneous	1.2
Watermelons	2.2	Idle and failure	4.3
Broomcorn	2.3		

organization varies considerably from farm to farm and in some places cotton is somewhat more important than in Frio County. On the surveyed farms peanuts were the dominant crop representing approximately two-fifths of the cropland. Feed crops (such as grain sorghums and corn) are fed primarily to cattle although some exchange occurs among farmers and ranchers. A considerable acreage is planted to rotation pasture (mostly sudan) for livestock grazing. Watermelons and broomcorn are important cash crops on some farms: returns from watermelons fluctuate widely depending on prices and marketing conditions.

In Frio County the major competition for the use of land occurs between peanuts and feed crops such as grain sorghums. Relatively large acreages of both peanuts and grain sorghums can be grown with the present mechanized methods of production. Per-acre returns to land, overhead, and management are much greater from peanuts than from grain sorghums (table 36). Returns from corn are even less favorable than from grain sorghums. Feed-crop acreages are important in rotations to maintain soil fertility and permit full use of resources.

Table 36.- Relative returns per acre from peanuts and grain sorghums on excellent, good, and fair soils for peanuts, 1943 prices and usual yields, Rio Grande Plain area, Texas 1/

Item	: A-Excellent : soils		: B-Good soils		: C-Fair soils	
	: Grain		: Grain		: Grain	
	: Peanuts: sor-		: Peanuts: sor-		: Peanuts: sor-	
	: ghums		: ghums		: ghums	
	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>	<u>Dollars</u>
Gross value of crop <u>2/</u>	:	:	:	:	:	:
Nuts or grain	: 37.74	19.00	28.56	20.90	17.68	9.50
Seed or hay	: 7.50		6.00		4.50	
Total	: 45.24	19.00	34.56	20.90	22.18	9.50
Specified costs	:	:	:	:	:	:
Seed	: 3.35	.32	3.35	.32	3.35	.32
Picking and hauling peanuts	: 3.33		2.52		1.56	
Bags	: 1.13	1.25	.85	1.38	.52	.62
Baling and wire	: 2.55		1.95		1.50	
Combining	:	3.00		3.00		3.00
Miscellaneous	: .20		.20		.20	
Pre-harvest man labor	: 2.88	1.15	2.88	1.15	2.88	1.15
Harvest man labor	: 3.50	.70	3.15	.70	2.80	.70
Tractor & equipment charge	: 6.40	5.60	6.40	5.60	6.40	5.60
Total	: 23.34	12.02	21.30	12.15	19.21	11.39
Returns for land, overhead, and management <u>3/</u>	: 21.90	6.98	13.26	8.75	2.97	- 1.89

1/ For physical requirements and 1943 costs of materials and services used in peanut and grain sorghum production in this area see appendix tables 10 and 11.

2/ Based on average prices of 6.8 cents per pound for peanuts and 1.9 cents per pound for grain sorghums.

3/ Represents the amount left over after deducting enterprise expenses and value of labor, power, and equipment used in production from the gross value of the product. Excludes land rent, management, and general overhead expenses.

Watermelons and truck crops require much more labor than peanuts or feed crops. In addition, these crops are somewhat speculative. When prices are favorable returns are high, but market requirements and resulting prices vary greatly from year to year. This fact, together with high labor requirement, tends to restrict acreages of watermelons and truck crops to a small proportion of the cropland.

#### Other areas in Oklahoma and Texas

Soils suited to peanuts in the Coastal Plain section of Oklahoma are similar to those in the northeast Texas Sandy Lands. Yields of cotton, however, are lower and suitable soils for peanuts are somewhat more concentrated. Considerable areas of limestone prairie soils and alluvial land are found in these counties that are not suitable for peanuts. Yields of cotton on these soils are considerably higher than on the soils used for peanuts.

The Ouachita Highlands area located in southeastern Oklahoma comprises a body of rolling to hilly and mountainous forested land with relatively small areas of arable soils. The soils are low in organic matter and only moderately productive. It is predominately a livestock area though a considerable acreage of peanuts was planted during the war. Relative yields appear to be somewhat less favorable than in the Coastal Plain or Cross Timbers area.

#### WAYS OF INCREASING PRODUCTION EFFICIENCY

Reduced labor requirements and increased yields are the two principal methods farmers can use in raising their efficiency in producing peanuts. Like cotton, peanuts generally require large amounts of hand labor. This fact limits the production per man and reduces the opportunities for large returns. Hand labor can be saved through mechanizing the production and adopting labor-saving practices. On some farms, particularly in the subhumid areas, production has been almost entirely mechanized and the volume of production on these farms has been greatly increased. Yields may be substantially increased by the use of improved practices and by good land selection. Some general increases in the yield level were made before the war, but wartime increases in acreage in less suited areas brought a reversal of this trend.

#### Changes in Technology

The rapid improvements in cultivating and harvesting machinery for most field crops have not yet eliminated the half-row equipment and hand labor commonly used with peanuts in the more humid areas. Improved methods are available in most of them which will substantially reduce the labor and, with proper changes in farm organization and operation, will increase the production efficiency and level of farm income. In many instances, however, this will require increases in the size of the unit and the crops grown.

Many of the labor-saving methods are already in operation. It is not correct to think of all farmers in the humid areas as relying entirely on mule power and hand methods and the farmers in the subhumid areas universally using tractor power and mechanized methods. The differences in production methods in the two types of areas are striking, but they are a matter of degree. The range of practices in the humid areas is very wide. Some farmers have approached the degree of mechanization common in the western areas but generally the methods adopted have been less radical.

The saving in labor by farmers who use tractors has usually been in preparing the land and in cultivating (table 37). Some eliminate hoeing operations with frequent and early use of a weeder and other cultivating tools, but most farmers have continued to hoe Spanish and Virginia types of nuts.

The greatest impediment to the adoption of the semi-mechanical operation in the East, at present, is the lack of tractors. Mechanization in the eastern part of the Cotton Belt has been slow until recent years. Farms have been small and the crops generally are less adapted to machine methods than in other parts of the country. Recent emphasis on mechanization may greatly change this picture during the next quarter of a century.

The use of labor-saving methods in digging and stacking has been less common. Few growers in the Southeast and Virginia-North Carolina areas plow up nuts with a tractor plow and shake and rake into a windrow with a side-delivery rake. The vines may be stacked by fork or by hand. Some farmers who use side-delivery rakes stack the nuts by hand in order to reduce the risks of damaging the nuts by poor stacking. Where the nuts are stacked with a fork, a waterproof cover maintains the quality of the nuts. Studies in Georgia and Alabama indicate that man-labor requirements for digging and stacking are reduced one-half to three-fifths by use of side-delivery rakes in windrowing and pitchforks in stacking.<sup>19/</sup> In rainy seasons in the Southeast this kind of operation may bring difficulties and some damage to the nuts. Hendrix, Butler and Goodman reported that "In 1942 considerable difficulty was experienced by Spanish growers in the use of side-delivery rakes because of a rainy harvest season. On farms where rakes were available most of the peanuts were harvested by hand. A few operators who had large acreages and were depending entirely on side-delivery rakes suffered heavy losses. In previous years, however, the use of side-delivery rakes has been an effective means of reducing man labor needs for harvesting . . . . ."

A few digger-shaker machines are used in Virginia and North Carolina. This machine reduces the hand labor required in shaking and gathering the vines. A similar peanut harvester that reduces hand labor

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<sup>19/</sup>"Peanut Production Possibilities in Georgia," by Hendrix, W.E., Butler, C.P., and Goodman, K. V. Bul. 228, 1943, p. 11 and "Peanuts a War Crop on Alabama Farms" by Harrington, A. H., Jones, P. E. and Lagrone, W. F. Ala. Agr. Expt. Sta. (Mimeo.) 1943, Op. Cit. p. 11.

Table 37.- Labor used in producing peanuts with alternative methods of production, selected areas <sup>1/</sup>

Area and method of operation <sup>2/</sup>	Man labor used per acre <sup>3/</sup>			Power required	
	Total	Pre-harvest	Harvest	Horse or mule	Tractor <sup>3/</sup>
	Hours	Hours	Hours	Hours	Hours
<u>Northern Coastal Plain, N.C.</u>					
Usual (mule or horse power)	67.0	32.5	34.5	42.0	
Tractor power	51.0	18.2	32.8	<sup>4/</sup> 7.5	8.7
<u>Southeast Coastal Plain, Ga.</u>					
Usual (mule or horse power)	55.4	19.4	36.0	36.5	
1-row tractor power	46.8	10.8	<sup>5/</sup> 35.0	2.5	8.0
<u>Ga.-Ala. Coastal Plain (old peanut area)</u>					
Usual (mule or horse power)	60.0	30.0	30.0	43.0	
Tractor power	45.0	16.5	<sup>5/</sup> 28.5	<sup>4/</sup> 4.5	9.8
Tractor power, raked and stacked with fork	34.6	16.5	18.1	<sup>4/</sup> 3.5	10.7
<u>N.E. Texas Sandy Lands</u>					
Usual (mule or horse power)	55.0	26.4	28.6	35.0	
1-row tractor power	47.0	18.8	28.2	<sup>4/</sup> 1.8	10.1
<u>Eastern Oklahoma</u>					
Usual (mule or horse power)	53.0	23.5	29.5	42.0	---
Tractor, shaken and stacked	43.6	15.7	27.9	<sup>4/</sup> 6.5	6.3
Tractor, raked and threshed from windrow	25.1	15.7	9.4	<sup>4/</sup> 6.5	7.1
<u>Rio Grande Plain, Texas</u>					
Usual (2-row tractor power)	21.0	11.5	9.5	---	6.4
Raked and combined	13.6	11.5	2.1	---	6.4

<sup>1/</sup> Based on local studies. Some adjustments from published figures necessary for level of equipment and in synthesizing information in cases where more than one study was made in same area or data were for a particular year. So far as possible original records and tabulations were used in this process.

<sup>2/</sup> Usual labor required for peanuts shaken and stacked in all areas except Rio Grande Plain. Tractor operations are for same general operations as usual, except as indicated.

<sup>3/</sup> Excluding man and tractor labor furnished by picker-operator commonly performed on a custom basis.

<sup>4/</sup> Mule or horse work performed in harvesting.

<sup>5/</sup> Assumes shaking, stacking, and picking methods to be same as shown for horse operations.

has been developed by the Alabama Agricultural Experiment Station and is used by some Alabama farmers. Driven by tractor power, the machine digs, shakes, and windrows the vines in one operation. The vines then may be stacked by hand or by fork. Less labor is required than in the hand-shaking method, but somewhat more than in the method of picking from the windrow, which is adapted to the Texas areas.

To demonstrate merely that machine methods will reduce the labor is not enough to warrant conclusions regarding the early adoption of completely mechanized methods of production. The use of machinery for harvesting peanuts must increase the net income from the crop. Savings in labor costs must be balanced against increased loss in the quality of peanuts and increased costs of machinery. These factors may delay for sometime the mechanization of peanut harvest in the Southeastern and Virginia-North Carolina areas.

In parts of central and eastern Oklahoma, particularly in the Cross Timbers area, the use of a side-delivery rake and threshing from the windrow, or small stacks built with a pitchfork, is somewhat more common than in the Southeast. Much labor is saved by such methods but the danger of rainy weather which would bring damage to the peanuts is considerable, although not as important as in the areas of higher rainfall.

In the subhumid areas the use of tractor power and a side-delivery rake is the common method of production. Some farmers in the Rio Grande Plain not only windrow the nuts with a side-delivery rake but when dry use a mobile picker or combine with a pick-up attachment to thresh the nuts. Unless a baler or wagon is also attached the hay is left on the field.

The use of combines for peanuts is found most in the Rio Grande Plain, but a few farmers in other areas such as the West Cross Timbers of Oklahoma and Texas use them, thus eliminating hand labor in peanut harvesting. The peanuts are dug with a tractor, are shaken and put in a windrow with a side-delivery rake. After curing, a pick-up combine is used to thresh the peanuts from the windrow. In this way the harvesting crew can be reduced to three or four men. Some adjustments are necessary to adapt the combine to peanut threshing. Usually a larger pulley is used, slowing the cylinder to half speed; part of the concaves are removed, screens and air are speeded up, and the auger is worked over to avoid cracking the nuts.

#### New Methods Used on Cotton

Both peanuts and cotton still generally require large amounts of hand labor. One important problem is whether the adoption of those mechanized methods which are practical will shift the competitive balance in favor of cotton or peanuts. The answers to this question revolve around the adaptability of mechanized methods to the two crops. At this time answers must be tentative. Innovations are numerous and practices are constantly changing.

Where tractors are used in the eastern part of the belt the principal reduction is usually in pre-harvest labor for both cotton and peanuts. Reductions in pre-harvest labor are similar for both crops, occurring mainly in land preparation and cultivation. The need for hand hoeing is not usually eliminated by mechanized cultivation. A study of farm mechanization in the northern Coastal Plain area in North Carolina in 1943 indicated total man labor requirements were reduced 20 percent on cotton and 24 percent on peanuts, where tractor power was used. <sup>20/</sup> The reduction in operating expense was 18 percent for cotton and 26 percent for peanuts where tractors were used. Part of the reduction in expenses for peanuts was accounted for by the savings involved in being able to own and use a picker instead of relying on custom picking.

A similar study in Bulloch County, Georgia, indicates the reduction in man labor on farms, where tractors are used, for cultivating and land preparation are about the same for cotton and for Runner peanuts. The use of 1-row tractor equipment on cotton resulted in a saving of approximately 11 man hours or 14 percent, as compared with man-labor requirements for two-mule equipment. On peanuts, the labor saved per acre was approximately 7 hours or 13 percent. <sup>21/</sup> In general, the effect of the use of tractor-operated machinery as now practiced on land preparation and cultivation operations appears to be similar for cotton and peanuts.

Under the range of present practices used in the important peanut-cotton areas, methods of reducing harvesting labor for peanuts seem considerably further advanced than is the case with cotton.

Two new developments in cotton production which have not yet come into general use deserve consideration. These are the mechanical cotton picker and the flame cultivator. Most of the mechanical cotton pickers have been used in the Delta areas. Tentative information regarding production costs seem to indicate that considerable saving may be effected in these areas. <sup>22/</sup> Most of the important peanut areas, however, have relatively low cotton yields, averaging in most instances about half the yields in the Mississippi Delta. As mechanized-cotton costs per acre will tend to remain about the same regardless of yields, the costs per pound would probably be much higher in the peanut areas. In addition, the small fields and other topographical features may reduce efficiency in the use of a picker in such areas considerably.

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<sup>20/</sup> James, H. Brooks and Barlow, Frank D., "Farm Mechanization, N. C. Bul. 348, 1944, pp. 16 and 17 and 20 and 22.

<sup>21/</sup> Hendrix, W. E., and Fullilove, W. T., "Labor and Power Needs on Crops in Bulloch County, Georgia," Circular 139, 1942.

<sup>22/</sup> Welch, F. J. and Miley, D. G., "Mechanization of the Cotton Harvest," Bul 420, 1945.

The development of the flame cultivator is perhaps not so advanced as the development of the cotton picker. However, successful development of flame cultivation would likely shift the competitive balance in favor of cotton, since the use of this machine on peanuts seems unpromising.

General adoption of other major agricultural machines has almost invariably taken several years. The same will probably be true of cotton and peanut harvesters and cultivators. Many farmers will wait for the inevitable improvements. Large farmers will adopt them more rapidly than small farmers. But in all cases the labor supply at wages farmers are willing to pay will be an important influence on the rate of adoption of machinery. The scarcity of such labor gave a great impetus to the adoption of labor-saving devices. If labor again becomes plentiful at lower wages the adoption of mechanical power will be retarded. The low wages to labor, especially in the Southeast, has delayed the shift from one-mule to two-mule equipment and from horse power to tractor power. The 1937-41 average hourly rate in the Southeast was 9 cents for pre-harvest labor and 10 cents for harvest labor. It has often been as cheap in the Southeast to use a man as to use a mule for the same period of time, if total feed and depreciation costs are apportioned on the hours of mule labor actually performed.

#### Increasing Yields through the Adoption of Improved Practices

One of the chief ways of increasing farm income in the humid areas of the South is through improved practices. Striking increases have already been made in cotton yields through increased use of fertilizer, better land selection, better varieties of seed and green manure crops. <sup>23/</sup> Further increases in the yields are in the offing. Recently, increased attention has been given to the possibilities of increasing yields of other crops. Proper fertilization, the use of hybrid seed corn, and new varieties of oats are some of the recommended practices to increase yields of feed crops.

It is believed that the average yield of peanuts can be raised materially in a relatively short time. Estimates of adjustments that it would pay farmers to make, under assumed postwar prosperity conditions indicate that substantial increases in peanut yields should be made. <sup>24/</sup> If farmers adopt the improved practices that would be profitable under favorable conditions, the average yield per acre would be increased 20 percent over the prewar yield. Largest increases would occur in the Southeast and Virginia-North Carolina areas (table 38). The acreage in Virginia-North Carolina would return to about prewar levels, enabling farmers to carry out established rotations to maintain soil fertility. Increased emphasis would be given to seed treatment and dusting of peanuts (dusting the growing vines for insect and disease control). Increased

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<sup>23/</sup> See "Changes in Cotton Production in War and Peace," by E. L. Langsford, F.M. 45, 1944 (mimeo.), pp. 7 and 8.

<sup>24/</sup> See "Peacetime Adjustments in Farming," U. S. Dept. Agr. Misc. Pub. 595 for statement of assumptions used.

Table 38.- Peanut yields per acre 1937-41 and postwar bench mark, selected areas 1/

Area	1937-41	Postwar bench mark
Virginia-North Carolina area	1,251	1,583
Georgia-Alabama edible nut area	737	1,028
Eastern Oklahoma <u>2/</u>	509	550

1/ From reports of State Production Adjustment Committees, Dec. 1944.

2/ Includes the following areas in Oklahoma: Cross Timbers, Ozark-Ouachita and Coastal Plain.

yields in the edible-nut area in the Southeast could be accomplished by improved rotations, better cultural practices, the wider use of treated and shelled seed, increased dusting, and proper fertilization practices.

In general, the greatest immediate opportunities for increasing yields appear to be associated with (1) land selection, (2) time of planting, (3) seed treatment and proper seeding rates, (4) clean cultivation and fertilization, and (5) control of leaf diseases.

#### Land Selection

In the older areas the most important problem in land selection is in devising rotations that will maintain or increase rather than reduce the crop yields. In planning the rotation it is advisable to plant peanuts following a well-fertilized crop such as cotton, tobacco, or truck crops. Peanuts can use residual fertilizer efficiently. Experiments in the Georgia Coastal Plain indicate yields are approximately 50 percent higher when peanuts follow cotton which was fertilized than when they follow corn. 25/

A suggested rotation for the humid areas of the South would be along these lines:

1. First year, cotton fertilized.
2. Second year, Spanish peanuts fertilized and side-dressed with a high potash fertilizer followed by Austrian winter peas or oats after peanuts are harvested.
3. Third year, corn interplanted or oats followed by cowpeas.

In areas where root rot is prevalent the practice of leaving stalks from a heavy stemmed crop on the land during the winter fosters the growth of the root-rot organism. In these areas the stalks should be removed or peanuts should follow a light-stemmed crop.

25/ See Ga. Bul. 209, "Culture and Fertilizer Studies with Peanuts," by Gore, U. R., 1941; also N. C. Bul 330, "Soil Fertility Studies with Peanuts," by Collins, E. R. and Morris, H. D., 1942.

In new areas peanuts are often used to "fill in" on otherwise idle land. Cotton and other crops are given first choice on the land. As a result, peanuts are sometimes planted on less well adapted land where returns may be less than from other crops. As has been shown (table 25), this situation was found to be particularly true in the Northeast Texas Sandy Lands. On the farms surveyed in Smith County peanuts were grown largely on fair and good soils, although yield estimates indicate that largest returns (both absolutely and relative to cotton) could have been obtained on the best soils. A similar tendency was noted on the farms surveyed in the Coastal Plain of South Carolina.

Soils most favorable for peanuts are well drained and have sandy surface layers at least 10 inches thick, overlying finer-textured subsoils. Sandy loam or fine sandy loam surface soils are especially suitable, although some varieties produce well on coarser or finer soils. Sandy surface layers allow easy setting of nuts and make harvesting easier. Heavy soils will "puddle" if the peanuts are hogged-off. Large lumps of soil stick to the peanuts when they are dug from heavy soils, making the job of harvesting very difficult. In general, the subsoil should be of finer texture than the surface soil as the finer subsoils hold more water than others and, as a rule, contain or will hold more plant-food nutrients.

#### Planting the Peanut Crop

The time of planting varies by areas, of course, but for best yields peanuts generally should be planted as soon as the soil becomes warm. In the Rio Grande Plain of Texas and a few other places, planting dates are concentrated in two distinct periods - early planting usually comes between March 15 and April 15 and late planting between May 15 and June 30. If there is inadequate moisture planting may be delayed until late in June.

Recent investigations have shown, however, that, in general, peanuts usually have an optimum period for planting. In the Georgia Coastal Plain, data from experiments covering a 7-year period indicate yields of Spanish peanuts planted March 15 were about 8 percent higher than of those planted April 15. <sup>26/</sup> Yields of later planting were still lower. Similar reductions were noted for Runner peanuts. Experiments at the Upper Coastal Plain Station in North Carolina indicate that yields can be increased by about 5 percent by planting at the proper time. <sup>27/</sup> The most desirable planting dates were found to be from April 10 to 15.

Treatment of the seed before planting prevents decay and reduces seed and soil-borne diseases, assuring even stands and better yields. Arasan or ceresan materials may be used for the treatment. The seed should be dusted by placing in a tight container that can be rotated to get good coverage. The costs are small.

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<sup>26/</sup> "Peanut Production in the Coastal Plain of Georgia," by Parham, S. A., Ga. Coastal Plain Expt. Sta. Bul. 34, 1942.

<sup>27/</sup> "Production Adjustments in Agriculture," N. C. State Report, by N. C. Agr. Expt. Sta., N. C. Agr. Ext. Service and Div. of Farm Mgt. and Costs, BAE, 1944.

Far too few farmers realize the importance of seed treatment. The number of North Carolina farmers following this practice in 1943 was estimated at only approximately 13 percent and the number of Georgia farmers planting good machine-shelled and treated seed was estimated at approximately 10 percent. 28/

A test to learn the effect of ceresan on peanut seed prepared for planting by different methods was carried out by the Georgia Coastal Plain Experiment Station in 1940. It showed that, with a given rate of planting, machine-shelled treated seed would yield more than hand-shelled untreated seed and not a great deal less than hand-shelled treated seed. Machine-shelled seed yielded 360 more pounds per acre when treated - an increase of 29 percent. Hand-shelled seed produced only 108 more pounds per acre when treated; nevertheless this was a worth while increase (table 39). Although the data on which table 39 is based represent the results of only one year's tests, they may be used as an indication of gains that might be expected from seed treatments.

Table 39.- Yield increases from treating peanut seed prepared for planting by different methods 1/

Type of seed and treatment	: : Germi- : nation :	:Number of :plants in :50-ft. row :at harvest	: Average : yield of : 50-ft. : row	: Average : yield : acre : basis
	: : <u>Percent</u>	: : <u>Number</u>	: : <u>Pounds</u>	: : <u>Pounds</u>
Hand-shelled (untreated)	: 82.2	: 81.2	: 4.56	: 1,589
Hand-shelled, ceresan-dusted	: 88.6	: 86.4	: 4.87	: 1,697
Machine-shelled (untreated)	: 50.8	: 46.4	: 3.60	: 1,254
Machine-shelled, ceresan-dusted	: 79.8	: 68.2	: 4.63	: 1,614
Pegs (untreated)	: 67.8	: 61.8	: 3.62	: 1,262
Pegs, ceresan-dusted	: 83.4	: 78.8	: 4.27	: 1,488
Not shelled (untreated)	: 21.8	: 22.0	: 2.07	: 721
Not shelled, ceresan-dusted	: 29.2	: 27.4	: 2.47	: 861

1/ Conducted by the Ga. Agr. Expt. Sta. in cooperation with the Bureau of Plant Industry at Tifton, Ga., in 1940; 2-percent ceresan treatment used. Test plots were planted in 50-foot rows; 100 seed were planted in each row. Only 2 percent ceresan should be used; 5-percent produces serious injury to peanut seed.

28/ State Reports on Postwar Adjustments by N. C. Agr. Expt. Sta., N. C. Agr. Ext. Service and Div. of Farm Management and Costs, BAE, 1944, and the Ga. State Agricultural Production Capacity Committee.

### Choosing the Form of Seed for Planting

Peanuts are commonly planted in one of four forms - hand-shelled, in the hull, machine-shelled, and pegs. <sup>29/</sup> Failure to obtain a good stand is probably the most common cause of low yields.

Hand-shelled seed are best but are more expensive than machine-shelled seed. Properly treated, however, machine-shelled seed will give satisfactory results. Treated pegs (large) also can save satisfactory results. Seed planted in the hull are least effective. Data from table 39 show the relative effectiveness of a given quantity of treated seed planted in four forms, as follows:

<u>Type of seed</u>	<u>Average yield, acre basis</u> <u>Pounds</u>
Hand-shelled (treated)	1,697
Machine-shelled (treated)	1,614
Pegs (treated)	1,488
Not shelled (treated)	861

Peanut seed may be shelled by either hand or machine, as early as January 1 of the year they are to be planted without materially injuring germinating quality, provided they are fungicide-treated before being planted. Unshelled seed usually bring uneven stands, because of poor germination.

More attention should be paid to seeding rates and varietal improvements. Assuming that reasonably good germination can be obtained by using shelled and dusted seed, the proper spacing on the land has much to do with yields. Experimental evidence seems to indicate that the usual seeding rates may be somewhat too low, especially in the Southeast. Planting distances depend partly on the fertility of the soil and the rainfall, but mainly upon the variety grown. Spanish and similar varieties may be planted much closer than Runner varieties. Practical growers in south Georgia recommend 24 rows with 3-inch spacing of seed in the row, for Spanish peanuts. Row width of 27 to 30 inches and 6 to 8 inches in the row, seem best for runners. Large-growing Virginia type peanuts require more room, usually 30 to 32 inch rows with the plants 9 to 12 inches apart, in the row.

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<sup>29/</sup> Pegs are small and shriveled nuts that are screened out at shelling plants, as the peanuts are being prepared for market. Some growers use them because they are cheap. According to Bul. No. 34 of the Georgia Coastal Plain Experiment Station, pegs are as good as larger seeds so far as inherited characteristics are concerned, but seedlings produced by pegs are weaker and start growth more slowly than plants from plump, well-filled seed. There are two grades of pegs: (1) large, which are undersize but round nuts, and (2) small, which include many shriveled, undeveloped nuts. Only the large pegs should be used for planting.

Good seed selection has been seriously neglected. The use of poor-quality seed will usually reduce the value of the crop greatly. Only No. 1 unmixed, high-yielding, shelled, fungicide-treated seed of an adapted variety should be used.

Data developed by the Mississippi Agricultural Experiment Station indicate that substantial increases in yield can be made by using good seed. In a 2-year test conducted at Lauderdale, Mississippi, seed selected for 2 years produced 83 pounds per acre more than ordinary planting stock and 171 pounds more than did seed from peanuts that had only one nut per pod. 30/

### Clean Cultivation

Too often, particularly in new areas, farmers use exactly the same methods and equipment for cultivating peanuts as for cultivating corn and cotton. It is not generally possible to keep peanuts clean enough to assure the best yields if cultivation is carried out in this way. A test conducted at the Wire Grass Substation, Headland, Alabama, indicates that peanuts growing with considerable grass yield but little over half as much as when they are clean cultivated.

Peanuts require close and careful cultivation in the early stages of growth to prevent grass and weeds from getting a start. Most of this early cultivation can be done effectively with a weeder. The common weeder is probably the most satisfactory tool for early cultivation as it destroys small weeds and does little injury to young peanut plants. If a weeder is not available, a light-section harrow can be used. These implements can be run diagonally across the rows, first in one direction and then in the other, as often as needed (usually 3 to 5 times at 3 to 5 day intervals) to keep down grass until the pegs begin to form. This early cultivation is very important in reducing hoeing to a minimum. After peanuts become too large to be worked with weeders it is necessary to cultivate the crop several times. Later plowings should be shallow (with a scrape) to kill grass and weeds and to work loose soil around the vines. There is difficulty in digging unless peanuts are "laid by" clean.

### Fertilizing Peanuts

Peanuts are often classed as a "heavy feeder." They seem able to take nutrients, especially potassium, out of the soil more completely than other crops. When they are grown without rotation, the yields are reduced and the land is sometimes made almost worthless for other crops. This is particularly true if peanuts are not fertilized. Part of the reason for depleting nature of harvested peanuts lies in the fact that

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30/ "Peanut Production," by H. O. West, Miss. Agr. Expt. Sta. Bul. 366, 1942.

both hay and nuts are taken off the land. The value of the plant nutrients removed in the hay about equal the sale value of the hay in the older commercial areas. 31/

The response of peanuts to fertilization is not so consistent as is the response of other field crops. It has been found that in most cases peanuts give little response to the application of fertilizer, particularly if the crop is produced on fertile soil or if it follows a highly fertilized crop. Experiment Station results indicate that the chief fertilizer needs for peanuts include phosphorus, calcium, and potash. The experimental work that has been done on fertilizers for peanuts is still limited in scope.

By way of summarizing available experimental work, it appears that in the Southeast, where Spanish peanuts follow a crop that has received little or no fertilizer, an application of 300 pounds of a complete fertilizer (such as 3-9-6) side-dressed with 75 pounds of nitrate of soda should give profitable results.

Virginia Bunch growers commonly apply about 400 pounds of lime potash substance in the row at planting time, supplemented with about the same quantity of gypsum applied at full-bloom stage. This practice follows closely recommendations based on experiments. Gypsum is required, however, only on acid soils and lighter sandy soils.

Experimental data obtained so far on North Carolina Runners seem to indicate that they respond even less to nitrogen fertilizers than Spanish. Runners are generally fertilized with gypsum at the full-bloom stage. A mixed fertilizer with limestone added is also recommended for poor soils.

Fertilizer reduces the drain on plant-food elements of the soil - often evident when peanuts are harvested. When peanuts are planted in a rotation with well-fertilized crops, good yields should be obtained without fertilizer, since peanuts have the ability to use residual fertilizer left by the preceding crop. Available data show that most of the phosphorus, much of the potassium, but only a little of the nitrogen remain in the soil after a well-fertilized cotton crop is harvested. Peanuts require little nitrogen but draw upon the soil for phosphorus, potassium and calcium.

#### Controlling Peanut Diseases

Most farmers have not recognized the great damage and lowering of yields done by the leaf spot disease in the peanut crop. Both hay and nuts are affected. Preliminary estimates indicate that only one-fourth of the Virginia-North Carolina crop is dusted and even less of the Southeastern crop was dusted in 1943. Otherpeanut diseases more or less

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31/ See Ga. Expt. Sta. Bul 209, "Culture and Fertilizer Studies with Peanuts," by Gore, U. R., 1941; also N. C. Expt. Sta. Bul 330, "Soil Fertility Studies with Peanuts" by Collins, E. R. and Morris, H. D., 1942.

prevalent include southern root rot, wilt, and several seed- or soil-borne diseases that cause decay of the planted seed before or at the time of germination.

No effective control is known for root rot and wilt, except possibly rotation. Seed-borne or soil-borne diseases can evidently be effectively controlled by seed treatment.

Tests conducted by the Georgia Agricultural Experiment Station to control leaf spot have shown that substantial yield increases can be obtained by dusting peanuts with sulfur during the latter part of the growing season (table 40). Yield increases directly attributable to three sulfur dust applications for the period 1937-41 averaged 326 pounds per acre. Both quality and quantity of hay production was also considerably increased by the sulfur treatment. Several other dusting materials have been used with good results. Copper-sulfur dust 10-90, has been tested for two seasons and found to be even more effective than sulfur dust as a control for peanut leaf spot. <sup>32/</sup> Whether or not yield increases will be sufficiently high to pay for the extra cost of the copper-sulfur dust has not as yet been determined. Costs of dusting range from \$2.50 to \$4.50 per acre at present prices.

Table 40.- Summary of results from dusting tests on Spanish peanuts, 1937-41 <sup>1/</sup>

Material	:	:	:	Average yield		Average
	:	Year	Number	per acre		increase
	:	tested	tests	Dusted	Check	per
	:	:	:	:	:	acre
	:	Number	Number	Pounds	Pounds	Pounds
Sulfur dust	:	5	45	1,656.0	1,329.6	326.4
Copper sulfur 10-90	:	2	5	1,663.4	1,236.5	426.9
Copper-sulfur-clay	:					
10-30-60	:	1	3	1,578.3	1,155.1	423.2
Copper-wheat flour-clay	:					
10-10-80	:	2	4	1,433.2	1,138.0	295.2
Red-copper-oxide-clay	:					
10-90	:	1	3	1,599.2	1,155.1	444.1
Sulfur gypsum 1-3	:	1	1	1,387.0	1,164.1	222.9

<sup>1/</sup> Annual report 1940-41 Ga. Expt. Sta., p. 105. Experiments were done in cooperation with the Bureau of Plant Industry, USDA, the Ga. Coastal Plain Expt. Sta., the Ga. Ext. Service, the Freeport Sulfur Co., and the Tennessee Corporation.

<sup>32/</sup> "Increased Yields of Spanish Peanuts Obtained by Dusting," by Naomi C. Woodroof, Circ. 136, Ga. Expt. Sta., 1942.

Peanuts should be dusted whenever leaf spot appears. Dust should be applied at approximately 20 pounds per acre per application. If the weather is moderate to dry, three applications will be enough. If the season is wet four applications should be made.

#### Time of Harvesting

Peanuts must be dug at the right time to secure the maximum yield. If gathered too early, many nuts will be shriveled. If gathered too late, some nuts will shed from vines and others will have sprouted. Time of maturity is indicated by the yellowing of the foliage and shedding of the leaves. The majority of the kernels should be full grown and the skins have a distinct texture, taking the natural color of the variety. In addition, the interior of the shells should have begun to color and show darkened veins.

#### PEANUTS IN THE POSTWAR PERIOD

Despite the marked upward trend in the use of peanuts and peanut products in the prewar period, increases in production tended to be larger than could be sold at prices satisfactory to growers. The pressure for expansion in peanut acreage was considerably increased by programs to reduce cotton acreage and production. Beginning with 1934, marketing and production control programs were established to keep peanut production more nearly in balance. The production programs limited only the rapidity of expansion. The upward trend in acreage continued but at a slower rate than might have otherwise occurred. Production of peanuts increased from 820 million pounds in 1933 to nearly 1.5 billion pounds in 1941, some increase in picked and threshed production being made each year except for 1941 when marketing quotas were applied. During much of this prewar period the production exceeded the needs for edible purposes by a substantial amount. A large part of this excess was diverted from edible to oil uses. The quantities thus diverted in the 8-year period (1934-41) total 1.4 billion pounds - or slightly less than the production for the 1941 crop.

During the war, the production of peanuts was about 60 percent above the 1934-41 prewar period. The increase during the war was used primarily to meet edible-nut demands, augmented by increased consumer incomes and shortages of other nuts, meat, and butter, and increased use of peanut butter in army diets. Additional quantities were diverted to oil uses to meet critical shortages in supplies of fats and oils.

#### Production Aspects

The great expansion in peanut production came during the years when cotton was subject to production controls and substantial land and labor resources were available. The discontinuance of cotton controls in 1943 left these crops freely competitive and the expanded level of peanut production has been maintained chiefly because of favorable prices

for peanuts. In the absence of production controls these crops will continue to compete for the use of the farmers' land and labor. Even if conditions arise requiring a return to production control programs on these crops, the comparative advantage of the areas should be considered whenever programs to fit postwar conditions are designed.

In most of the peanut areas direct competition between cotton and peanuts is of widespread importance. In some localities, vegetables and truck crops are important, but they are limited by available markets and specialized skills. Livestock enterprises are important as a supplemental source of income in most areas. Hogged-off peanuts, especially in the Southeast, appear to have possibilities for increased use as a feed crop.

Relative returns per acre from cotton and peanuts provide a reasonably good measure of comparative advantage in most of these areas since they are (1) the dominant cash crops, (2) cultural methods used on the crops are similar, (3) peak-labor requirements occur during the same seasons of the year, and (4) land suitable for peanuts is also adapted to cotton. However, this measure is not wholly conclusive since the production of both crops, in some areas, offers a chance to spread risks and establish good rotations.

Relative returns from peanuts and alternative crops indicate considerable divergence in the relative profitableness of the peanut enterprise with current production methods in the various type-of-farming areas and on different groups of soils. Table 41 shows the relative returns from cotton and peanuts with usual yields and 1943 prices, and the relative returns with 6 cents and 5 cents per pound for Virginia and Spanish peanuts. Prices of Runners are assumed at 5.5 cents and 4.5 cents per pound. In reality, southwestern Spanish peanut prices usually range between the southeastern Spanish and Runner prices. Comparisons between cotton and peanuts on different soils are therefore somewhat more reliable than comparisons between areas.

The Northern Coastal Plain in North Carolina is particularly well suited to peanuts (table 41). The production situation in the peanut-cotton area of Virginia is similar and the competitive situation apparently would be considered equally favorable in the Virginia area. The relatively large margin of returns from peanuts in this area probably accounts for the fact that it has been a relatively stable peanut area. Prices of peanuts must be very unfavorable in relation to cotton to cause much shift in acreage from one to the other. The acreage of peanuts is likely to be limited more by rotation requirements, and other enterprises are fitted in to supplement the chief cash crop. Extensive changes in peanut acreage can be expected only from exceptionally high or low relative prices for the crop.

Relative returns from the peanut enterprise in the Cross Timbers area in Texas are highly favorable. A considerable part of the large increase in production during the war came from abandoned and idle cropland. The relatively favorable prices for peanuts and lowered production

Table 41.- Relative returns per acre, cotton and peanuts on excellent, good, and fair soils with usual yields and varying prices, selected peanut areas

Area	Soil group <sup>1/</sup>	1943 price		Varying peanut	
		<sup>2/</sup>		prices per pound <sup>3/</sup>	
		Cotton	Peanuts	6 cents	5 cents
Northern Coastal Plain, North Carolina	A <u>Excellent</u> soils	33.81	73.31	51.68	36.23
	B <u>Good</u> soils	19.00	42.34	28.13	17.23
	C <u>Fair</u> soils	- .44	11.55	2.66	- 3.69
Southeastern Coastal Plain, Georgia area	A <u>Excellent</u> soils	25.63	37.03	25.33	16.33
	B <u>Good</u> soils	16.68	21.93	13.42	6.87
	C <u>Fair</u> soils	1.89	5.80	.73	- 3.17
Georgia-Alabama edible nut area	A <u>Excellent</u> soils	25.46	36.50	25.19	16.49
	B <u>Good</u> soils	12.58	19.33	11.27	5.07
	C <u>Fair</u> soils	.59	3.72	- 1.35	- 5.25
Northeast Texas sandy lands	A <u>Excellent</u> soils	19.33	24.89	19.53	12.83
	B <u>Good</u> soils	14.74	11.05	7.41	2.86
	C <u>Fair</u> soils	.95	- 1.28	- 3.44	- 6.14
Cross Timbers Oklahoma	A <u>Excellent</u> soils	18.53	25.24	19.48	12.28
	B <u>Good</u> soils	10.19	13.67	9.43	4.13
	C <u>Fair</u> soils	6.00	- 2.11	- 4.43	- 7.33
West Cross Timbers Texas	A <u>Excellent</u> soils	9.02	27.90	23.22	17.37
	B <u>Good</u> soils	6.55	20.78	17.02	12.53
	C <u>Fair</u> soils	4.11	8.77	6.57	3.82

<sup>1/</sup> Based on suitability for peanuts.

<sup>2/</sup> 1943 prices for cotton and peanuts are as follows: Northern Coastal Plain, North Carolina, 20.2 cts., and 7.4 cts.; Southeastern Coastal Plain, Georgia, 20 cts. and 6.8 cts.; Georgia-Alabama edible-nut area, 20 cts. and 7.3 cts.; Northeast Texas Sandy Lands 19.5 cts. and 6.8 cts.; Oklahoma Cross Timbers 18.5 cts. and 6.8 cts.; West Cross Timbers, Tex., 18.5 cts. and 6.8 cts.

<sup>3/</sup> Varying prices of Runner peanuts Southeastern Coastal Plain, Georgia, 5.5, 4.5, and 3.5 cts. per pound, respectively.

costs due to the adoption of mechanized practices both encouraged farmers to make this increase. Part of the land brought into production will probably continue even though peanut prices become much less favorable to cotton. The soils in this area, however, are very susceptible to damage from erosion and loss of productivity from continued cropping. These susceptibilities tend to make the crop acreage unstable.

The adoption of mechanized methods of production has enhanced the competitive position of peanuts in the Rio Grande Plain. Acreage there continued to expand throughout the war. Present acreages appear to be near the maximum that should be grown if soil resources are to be maintained.

Returns in the Coastal Plain areas in Georgia and Alabama are highly favorable to peanuts on the basis of 1943 prices, but with lower prices for peanuts there is more basis for competition between cotton and peanuts than in the North Carolina and West Cross Timbers areas. With peanuts selling at 6 cents per pound and cotton remaining at the 1943 price of 20 cents in the edible-nut areas, returns from the two crops are about equal on both good and excellent soils. On the fair soils the balance shifts to cotton; but most of the cropland is classified as good or excellent for peanuts. A somewhat similar situation is found in the Southeastern Coastal Plain area of Georgia with the returns from peanuts about balanced with 5.5 cents Runner peanuts on the excellent soils. On the good and fair soils returns are favorable to cotton at 20 cents per pound. The excellent group soils account for a little over half the cropland in the Southeastern Coastal Plain area. In these areas any substantial change in the relative prices of peanuts and cotton is likely to result in extensive adjustment in acreages of the two crops.

The present competitive situation in the Cross Timbers of Oklahoma is somewhat less favorable than in the areas previously discussed. This is especially true if some allowance is made for the fact that peanuts in this area usually bring somewhat lower prices than the Spanish peanuts in the Southeast. On the more favorable side, however, the opportunities for mechanized production must be considered. Prospects for rapid mechanization of the peanut enterprise are good. A considerable proportion of the farms have tractors, the size of the units are generally larger than in the other humid areas, and climatic factors are reasonably favorable.

Areas such as northeast Texas and similar areas in Arkansas, Louisiana, and Oklahoma appear to have the fewest opportunities for continuing or expanding the peanut enterprise on the basis of present competitive position. Although peanuts are now grown largely on the less productive of the soils suited to the crop, a comparison of enterprise returns from various soil groups indicates that if the crop is to continue on a commercial scale a shift to the better soils will be necessary. The continuation of a relatively large acreage in this area will depend mainly on the relationship of prices for peanuts and for competing crops, improvements in production and marketing, and the extent to which technological improvements can be adopted. The small fields and low crop acreage will limit the rapidity and extent of technological improvements.

With respect to relative returns the situation sums up about as follows. In areas such as Virginia-North Carolina and to some extent the Cross Timbers of Texas and the Rio Grande Plain area, it appears that peanuts would still remain the most profitable enterprise on suitable soils even though prices of peanuts were substantially lowered. In other areas, such as northeast Texas and eastern Oklahoma, peanut production with lower prices would be more profitable than cotton only where production is mechanized or soils are very suitable for peanuts. In the southeastern areas the extent of adjustments would appear to depend on the extent of the price decline and the improvements that are made in production efficiency, including yields and mechanization of production. Under normal conditions returns can be expected to be more favorable from peanuts than from cotton, particularly in the older areas and on the relatively large group of soils classified as excellent for peanuts.

The type of soil used for peanuts in a given area is often a primary influence in determining the profitableness of the crop. In general, the excellent peanut soils have a greater advantage relative to cotton than do good and fair soils. This is especially important in those areas where competition is so keen that only by producing peanuts on excellent soils can the crop be made the most profitable of the alternatives.

Some adjustments in acreage to conserve resources appear to be necessary in most of the intensive peanut areas. The percentage of the suitable cropland used for peanuts is particularly high in old areas in Virginia-North Carolina and in Georgia-Alabama. Acreage is also high in the West Cross Timbers of Texas. The susceptibility of soils to erosion in the Cross Timbers area and the loss of productivity from continued cropping may result in much land being left idle or abandoned unless proper practices are followed. More attention will need to be paid in the postwar period to labor-saving and yield-improving practices which will increase efficiency of production and reduce costs. The extent to which mechanized practices can be adopted will vary from area to area and even from farm to farm. Greatest progress in this direction has been made in the Western areas where conditions are especially favorable. Possibilities for increasing yields by more attention to seed treatment, dusting, and other practices are apparently good especially in the eastern part of the belt.

In a sense the problems of peanut production may be subsidiary to those of cotton. If market outlets for cotton are maintained or expanded and if a farmer has relatively free choice of crops he can grow, peanut production will probably be virtually restricted to those areas where it can be grown most efficiently. Some reduction in acreage may be expected on farms and in areas where production efficiency is low relative to cotton. The changes that occur in a freely competitive situation would encourage increases in production efficiency and lowering of costs.

If, on the other hand, cotton acreage is restricted, the acreage of peanuts can be expected to be chronically over-expanded. The cash-crop

farming in these areas will encourage farmers to maintain or expand peanut acreage even where production efficiency is low relative to cotton because of the need for substantial cash-crop acreages. Farmers have greatly increased their familiarity with peanuts during the war and the pressure toward production could be expected to be considerably greater than during the prewar period. It may be difficult to keep production within manageable proportions at reasonable prices in such a situation without some form of production control.

### Prospects for Consumption

The level of consumer incomes will be a considerable influence in determining the size of the markets for edible nuts. The level of consumer income, together with the price of cleaned and shelled nuts, explained most of the variations from the normal upward trend in disappearance during the prewar period. <sup>33/</sup> It has been estimated that, under assumed conditions of full employment, the picked and threshed peanuts that would be in demand would total 1,820 million pounds. <sup>34/</sup> This would represent 83 percent of the 1943 production and 148 percent of the prewar level.

Consumption of peanuts would be reduced considerably below this figure if the pattern of the first World War and its aftermath should be repeated. After the first World War the consumption of peanuts dropped rapidly and sales to the commercial trade remained below the wartime peak until the 1930 decade. But the position of peanuts may be somewhat different this time. The industry is considerably larger and indications are that aggressive action will be taken toward retaining present markets. Furthermore, an increasingly large share of production has been going into peanut butter and it is rather widely accepted as wholesome and economical food.

Increased incomes and shortages of butter and meats have greatly expanded the consumption of peanuts. In 1944 the quantity of nuts cleaned and shelled was 30 percent above the quantity that would be estimated based on prewar trends of quantities used in the edible trade (fig. 4). In addition, 230 million pounds of No. 2 nuts were diverted to oil under the Commodity Credit Corporation program in that year. In the postwar period, diversion of oil may prove to be less desirable and more expensive than in the 1930 decade, because of the increased importance of other domestic vegetable oils, especially soybeans, together with the availability of low-cost oils from foreign countries. <sup>35/</sup>

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<sup>33/</sup> "Fats and Oil Situation," Aug. 1943, U. S. Dept. Agr., Bur. Agr. Economics.

<sup>34/</sup> "What Peace Can Mean to American Farmers," Misc. Pub. No. 562, U. S. Dept. Agr., B.A.E. 1945.

<sup>35/</sup> See "World Trends in Major Oil Crops," by Hansen, P. L., F. M. 54 (mimeo.) 1946.

Then there will be questions of the extent to which new wartime consumption habits created by shortages of other foods can be retained and whether the position of peanut products in the postwar diet will be strengthened through education and other measures. Substantial adjustments in postwar consumption levels would appear probable unless aggressive action is taken to maintain present high consumption levels.

### Achieving Increased Consumption

Measures to increase consumption would apparently be highly desirable in the case of peanuts in the interest of both production and low-cost diets. The marked upward trend which existed before the war and the present high consumption provide some basis for optimism as to the effectiveness of such action.

A large part of the responsibility for increasing the use of peanuts rests with the industry itself. An advertising and education program has already been formulated and the nutritional qualities of peanut products is emphasized. Then greater care is being given to packaging and sales techniques.

Perhaps one of the most promising opportunities lies in the field of new developments in products. Peanut butter has forged ahead and now uses about half of the cleaned and shelled production. It is recognized as a nutritious and tasteful food, but it has a few qualities that need improvement. In a recent study by Woodroof, Thompson, and Cecil several methods have been suggested for preventing oil separation, flavoring, reducing the stickiness, and firming the butter for easy slicing. 36/

Peanut products, particularly peanut butter, seem in many respects to be very suitable for increased use in school-lunch programs and in programs to improve low-income diets. In nutritional qualities, peanuts compare favorably with meat and other high-protein foods (table 1). But some care would have to be taken to avoid diets containing an excess of fat, if peanuts are used. The quantity of peanuts and peanut butter now used by low-income families is much below that used by families whose incomes are more adequate. A cross-section study of family food consumption in the spring of 1942, by the Bureau of Home Economics and Bureau of Labor Statistics, provides some measure as to the existing consumption pattern and variation by income levels. 37/ According to this survey, approximately one family in four used peanut butter (table 42). In the lowest income class (under \$500) only one family out of eight used peanut butter, in contrast to approximately one family in three in the highest income brackets (over \$3,000). The quantity consumed averaged 0.18 pounds a week ranging from 0.1 pound in the lowest to 0.23 in the highest groups.

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36/ "Improving the Quality of Peanut Butter," Woodroof, J. G., Thompson, H. H., and Cecil, S. R., Ga. Expt. Sta. Bul. No. 243; Oct. 1945, (project sponsored jointly by Ga. Expt. Sta., National Peanut Council and T.V.A.).

37/ "Family Food Consumption in the U. S.," Misc. Pub. 550, U. S. Dept. Agr., 1944.

Table 42.- Peanut butter: Average quantity consumed at home per household per week and percentage of households consuming by net income class housekeeping families and single persons in the U. S., Spring 1942 <sup>1/</sup>

Annual net income class (dollars)	Peanut butter	
	Average quantity	Percentage
	consumed	of households
	Pounds	Percent
All classes <sup>2/</sup>	.18	24
0-499	.10	13
500-999	.16	23
1,000-1,499	.19	27
1,500-1,999	.17	22
2,000-2,999	.20	26
3,000-and over	.23	32

<sup>1/</sup> Source: "Family Food Consumption in the U. S.", Misc. Pub. 550, U. S. Dept. Agr., 1944.

<sup>2/</sup> Includes families with negative incomes not shown separately.

pounds in the highest income groups. These figures indicate that a considerable market may be found among families not now using the product, particularly among low-income families.

#### Peanuts as a Feed Crop

With proper supplemental grazing crops and feeding practices, peanuts for hogging off probably are the most efficient means of fattening hogs in the Southeast. The practice also gives the individual farmer a chance to diversify, get a better balance in his farming system, and gain certain advantages in soil conservation, as most of the residue is left on the land.

The trend toward mechanization and the use of tractors in the South, if continued, will release some of the land now growing feed for draft animals. This land could well be used to grow feed for other livestock enterprises. In many situations hogs will offer the best alternative for expanding livestock production in the peanut areas.

The extent of the increase in peanut acreage for hogging-off will depend on several factors. Among the more important are the development and use of supplemental grazing crops, the maintenance of increased market outlets, prices for edible nuts, and competition in hog production from other areas. A number of good supplemental grazing crops have been used with favorable results by Experiment Stations, but these crops are not yet in common use by farmers. Rapid advances in hog production in the Corn Belt make it necessary for the South to improve its efficiency in

this enterprise. The extent to which the South does this will be the most influential factor in determining the growth of the hog enterprise in that region. Market outlets have increased largely as a result of the war. The degree to which these outlets can be maintained or increased will have considerable effect on the production, and hence on peanuts as a grazing crop. Any programs to control the acreage of harvested nuts would tend to encourage hogging-off and the relative price of dug nuts would also have an effect.

Peanuts for hogging-off would seem to form an integral part in the development of the best adapted farming systems in the southeastern Coastal Plain area of Georgia-Alabama and Florida. The problem of gearing efficient hog production into the farming systems of this area offers a fertile field for further study.

Appendix table 1.- Minimum prices to producers for merchantable farmers' stock peanuts at customary receiving points 1944-45 crops

Sound mature kernels <u>1/</u>		Spanish type	Runner type <u>2/</u>	Virginia and Valencia types <u>3/</u>
Percent		Dollars per ton	Dollars per ton	Dollars per ton
Above	75	<u>4/</u>	<u>5/</u>	<u>6/</u>
	75	171.50	167.00	184.00
	74	169.20	164.80	181.60
	73	166.90	162.60	179.20
	72	164.60	160.40	176.80
	71	162.30	158.20	174.40
	70	160.00	156.00	172.00
	69	157.70	153.80	169.60
	68	155.40	151.60	167.20
	67	153.10	149.40	164.80
	66	150.80	147.20	162.40
	65	148.50	145.00	160.00
	64	146.20	142.80	157.60
	63	143.90	140.60	155.20
	62	141.60	138.40	152.80
	61	139.30	136.20	150.40
	60	137.00	134.00	148.00
	59	134.00	131.80	145.60
	58	131.00	129.60	143.20
	57	128.00	127.40	140.80
	56	125.00	125.20	138.40
	55	122.00	123.00	136.00
	54	119.00	120.00	133.00
Below	54	<u>7/</u>	<u>8/</u>	<u>9/</u>

1/ Includes whole loose shelled kernels.

2/ For the purposes of this program includes all peanuts, excluding Valencia which except for type, meet the "U. S. Standards for Farmers' Stock Runner Peanuts (1931)" but do not meet the "U. S. Standards for Farmers' Stock Spanish or Farmers' Stock Virginia Type Peanuts."

3/ For Virginia type peanuts, add \$1.50 per ton as a premium for each full 5 percent of Extra Large kernels in excess of 10 percent.

4/ \$171.50 plus \$2.30 per ton for each 1 percent above 75 percent sound mature kernels.

5/ \$167 plus \$2.20 per ton for each 1 percent above 75 percent sound mature kernels.

6/ \$184 plus \$2.40 per ton for each 1 percent above 75 percent sound mature kernels.

7/ \$119 minus \$3 per ton for each 1 percent or fractional part thereof below 54 percent sound mature kernels.

8/ \$120 minus \$3 per ton for each 1 per cent or fractional part thereof below 54 percent sound mature kernels.

9/ \$133 minus \$3 per ton for each 1 percent or fractional part thereof below 54 percent sound mature kernels.

Note: (1) A deduction from the above prices of \$2 per ton will be made for each full 1 percent damage in excess of 2 percent. (2) A deduction from the above prices of 50 cents per ton will be made for each full 1 percent foreign material in excess of 5 percent. (3) Above prices are for peanuts delivered in bulk in Georgia, Florida, Alabama, Mississippi, and that part of South Carolina that is south and west of the Santee, Congaree, and Broad Rivers, and Louisiana east of the Mississippi River. In all other States or parts of States peanuts must be delivered in sacks, as is the usual custom, except that Commodity Credit Corporation may authorize bulk delivery at those points equipped to handle such delivery.

Appendix table 2.- Examples of excellent, good, and fair soils for peanuts

In Virginia Area VII and North Carolina Area III

Group A - Excellent soils (average yields about 1,400 pounds per acre)

Cahaba fine sandy loam and sandy loam  
Faceville fine sandy loam and sandy loam  
Magnolia fine sandy loam and sandy loam  
Marlboro fine sandy loam and sandy loam  
Norfolk fine sandy loam and sandy loam  
Orangeburg fine sandy loam and sandy loam  
Ruston fine sandy loam and sandy loam

Group B - Good soils (average yields about 1,000 pounds per acre)

Cahaba sandy loam, deep or low phases  
Dunbar fine sandy loam and sandy loam (drained)  
Faceville coarse sandy loam  
Kalmia coarse sandy loam  
Norfolk loamy fine sand  
Norfolk fine sandy loam and sandy loam, deep phases  
Orangeburg fine sandy loam and sandy loam, deep phases  
Orangeburg coarse sandy loam  
Ruston sandy loam, deep phase  
Ruston coarse sandy loam

Group C - Fair soils (average yields about 640 pounds per acre)

Cahaba loamy sand and fine sand  
Craven fine sandy loam and sandy loam  
Dunbar coarse sandy loam and sandy loam  
Kalmia loamy sand  
Lenoir fine sandy loam and sandy loam  
Norfolk fine sand and loamy sand  
Onslow sandy loam  
Orangeburg fine sand and loamy sand  
Ruston loamy sand and fine sand

In Georgia Areas VI and VII and Alabama Area VIII

Group A - Excellent soils (average yields about 850 pounds per acre)

Blakely fine sandy loam  
Cahaba sandy loam  
Carnegie fine sandy loam and sandy loam  
Faceville fine sandy loam and sandy loam  
Greenville sandy loam  
Kalmia sandy loam  
Magnolia fine sandy loam and sandy loam  
Marlboro fine sandy loam and sandy loam  
Norfolk fine sandy loam and sandy loam  
Orangeburg fine sandy loam and sandy loam  
Red Bay fine sandy loam and sandy loam  
Tifton fine sandy loam

Group B - Good soils (average yields about 600 pounds per acre)

Greenville gravelly sandy loam  
Kalmia coarse sandy loam  
Norfolk loamy fine sand and deep phase of sandy loam  
Orangeburg coarse sandy loam and deep phase of sandy loam  
Tifton sandy loam and coarse sandy loam; and deep phase of these types

Group C - Fair soils (average yields about 400 pounds per acre)

Cahaba loamy sand, fine sand, and coarse sandy loam  
Greenville gravelly clay loam and pebbly phase  
Kalmia loamy sand  
Norfolk fine sand, loamy sand, and coarse sandy loam  
Orangeburg sand, loamy sand, and fine sand  
Scranton loamy sand and fine sandy loam  
Tifton sand and loamy sand

In Georgia Area IX

Group A - Excellent soils (average yields about 900 pounds per acre)

Cahaba fine sandy loam and sandy loam  
Carnegie fine sandy loam and sandy loam  
Faceville fine sandy loam and sandy loam  
Kalmia fine sandy loam and sandy loam  
Norfolk fine sandy loam and sandy loam and pebbly and gravelly phases  
of these types  
Ruston fine sandy loam and sandy loam  
Tifton fine sandy and sandy loam

Group B - Good soils (average yields about 650 pounds per acre)

Cahaba sandy loam and fine sandy loam, deep phases  
Eulonia fine sandy loam  
Fairhope fine sandy loam  
Kalmia coarse sandy loam  
Norfolk loamy fine sand  
Norfolk sandy loam, deep phase  
Ruston coarse sandy loam  
Ruston sandy loam, deep phase  
Tifton loamy fine sand and coarse sandy loam  
Tifton sandy loam, deep phase

Group C - Fair soils (average yields about 400 pounds per acre)

Cahaba loamy sand and fine sand  
Kalmia loamy sand  
Norfolk fine sand and loamy sand  
Ruston fine sand and loamy sand  
Scranton sand and loamy sand  
Tifton sand

In Rio Grande Plain, Texas Area VIII

Group A - Excellent soils (average yields about 550 pounds per acre)

Brennan fine sandy loam  
Duval fine sandy loam  
Duval fine sand, depression phase  
Laredo fine sandy loam  
Nueces fine sand  
Webb fine sandy loam, flat phase

Group B - Good soils (average yields about 400 pounds per acre)

Duval fine sandy loam, depression phase  
Duval fine sandy loam, deep phase  
Goliad fine sandy loam  
Webb fine sandy loam

Group C - Fair soils (average yields about 250 pounds per acre)

Duval fine sand and fine sandy loam, shallow phases  
Frio fine sandy loam  
Laredo silt loam, loam, and loamy very fine sand  
Maverick fine sandy loam  
Miguel fine sandy loam and fine sand

In Oklahoma Areas VII, VIII, XV, and Texas Area XII

Group A - Excellent soils (average yields about 700 pounds per acre)

Bastrop fine sandy loam  
Enterprise very fine sandy loam  
Miller fine sandy loam  
Nimrod loamy fine sand  
Windthorst fine sandy loam  
Windthorst fine sandy loam, colluvial phase  
Windthorst fine sandy loam, friable subsoil phase

Group B - Good soils (average yields about 500 pounds per acre)

Brackett fine sandy loam  
Milam fine sandy loam  
Miller very fine sandy loam  
Nimrod fine sand  
Nimrod loamy fine sand, deep phase  
Windthorst fine sandy loam, shallow surface phase; and gravelly sandy loam  
Yahola very fine sandy loam

Group C - Fair soils (average yields about 275 pounds per acre)

Brackett sandy loam  
Enterprise loamy fine sand  
Frio fine sandy loam  
Lincoln loamy fine sand  
Milam gravelly fine sandy loam  
Miller silt loam or fine sand

Group C - Fair soils (average yields about 275 pounds per acre), Cont'd

Nimrod fine sand, deep phase  
Trinity fine sandy clay loam  
Windthorst fine sandy loam, shallow phase  
Windthorst clay loam, sandy phase

In Texas Area XV (East Texas sandy lands)

Group A - Excellent soils (average yields about 650 pounds per acre)

Cahaba fine sandy loam and low phase  
Kirvin fine sandy loam, deep phase  
Nacogdoches fine sandy loam  
Norfolk fine sandy loam and sandy loam  
Orangeburg fine sandy loam and sandy loam  
Ruston fine sandy loam and sandy loam

Group B - Good soils (average yields about 450 pounds per acre)

Bowie very fine sandy loam  
Cahaba loamy fine sand  
Kalmia fine sandy loam  
Kirvin fine sandy loam  
Luverne fine sandy loam  
Norfolk loamy fine sand  
Norfolk sandy loam, deep phase  
Orangeburg loamy fine sand  
Orangeburg sandy loam, deep phase  
Ruston loamy fine sand  
Ruston sandy loam, deep phase  
Sawyer fine sandy loam  
Shubuta fine sandy loam  
Segno fine sandy loam

Group C - Fair soils (average yields about 270 pounds per acre)

Bowie fine sandy loam, slope phase  
Kalmia fine sand  
Kirvin fine sandy loam, flat and sloping phases  
Luverne fine sandy loam, sloping phase  
Norfolk fine sandy and dark-colored phase  
Orangeburg fine sand and loamy sand  
Ruston gravelly sandy loam and fine sand  
Segno fine sand  
Susquehanna fine sandy loam and sandy loam (on undulating slopes)  
Tabor fine sandy loam

Appendix table 3.- Percentage of cropland in excellent, good and fair soil groups by type-of-farming areas 1/

Area	A : <u>excel-</u> : <u>lent</u>	B : <u>good</u>	C : <u>fair</u>	Area	A : <u>excel-</u> : <u>lent</u>	B : <u>good</u>	C : <u>fair</u>
<u>Va.</u> area V <u>2/</u>	9	34	28	<u>Ala.</u> area IX	56	12	13
" VI	6	16	15	"			
" VII	57	27	7	<u>Fla.</u> area XIII	45	20	15
" VIII	32	20	18	" XIV & XV	34	20	25
" IX <u>3/</u>	31	47	7	" XVI	7	27	60
<u>N.C.</u> area I	10	18	14	<u>Miss.</u> area II	20	21	48
" II	14	31	23	" III	25	45	19
" III	33	25	9	" IV	28	28	15
" IV	50	27	16	" V	33	21	28
" V	32	31	17	" VI	45	25	24
" Va	20	16	25				
" Vb	4	11	15	<u>Ia.</u> area I	30	30	27
" VI	8	19	26	" II	25	26	28
" VII	3	12	14	" III	45	19	14
				" IV	37	24	23
<u>S.C.</u> area I	7	17	26	" V	52	15	12
" II	25	13	19				
" IIIa	62	14	11	<u>Ark.</u> area IV	22	34	15
" IIIb	53	15	20	" VI	34	32	20
" IV <u>4/</u>	43	11	25				
" V	67	4	17	<u>Okla.</u> area XI & XII	9	13	25
				" III & XIII	9	26	30
<u>Ga.</u> area III	9	29	33	Area VII, VIII, XV	19	19	21
" IV	8	34	30	" V & IX	2	27	22
" V	19	41	17	" XIV	27	36	13
" VI	58	20	18	" XVI	19	28	14
" VII	62	29	7				
" VIII	39	34	16	<u>Texas</u> area III	---	32	11
" IX	56	26	13	" IV	---	11	22
" X	34	20	25	" VIII <u>5/</u>	40	25	11
				" XI	17	14	21
<u>Ala.</u> area I	5	23	10	" XII	26	25	17
" II	6	49	13	" XIII	6	10	14
" IV	7	24	19	" XIV <u>6/</u>	2	11	8
" V	34	17	14	" XV	23	30	21
" VI	18	15	27	" XVI	1	6	5
" VII	24	24	11	" XVII	19	24	24
" VIII	43	14	16	" XVIII	---	3	7

1/ Some areas are excluded from this analysis because production possibilities are severely restricted. 2/ Excluding Patrick and Franklin Counties. These counties have an extremely high proportion of land unsuitable for peanuts. 3/ The northern half of this area is not included in these estimates. 4/ Excluding Oconee and Pickens Counties, which have an extremely high percentage of land unsuited for peanuts. 5/ Includes Wilson and excludes Kleberg and Kenedy. 6/ Excludes Wilson County. Soils suitable for peanuts are confined mostly to sandy areas in Blackland counties.

Appendix table 4.- Usual production requirements per acre for peanuts and cotton, by soil-suitability groups, northern Coastal Plain area, North Carolina

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	1,545	1,090	635	---	---	---
Hay	"	1,600	1,200	800	---	---	---
Lint	"	---	---	---	370	290	185
Seed	"	---	---	---	600	470	300
Production requirements:							
Seed	"	75	75	75	45	45	45
Fertilizer	"	325	325	325	425	425	425
Land plaster	"	300	300	300	---	---	---
Side dressing					100	100	100
Bags	Number	17.2	12.1	7.1	---	---	---
Labor:							
Pre-harvest man labor	Man hour	32.5	32.5	32.5	61.0	61.0	61.0
Harvest man labor	" "	38.0	34.0	29.0	1/	1/	1/
Mule labor	Mule hour	42.0	42.0	42.0	47.0	47.0	47.0

1/ Expressed in table 12 as a custom rate.

Appendix table 5.- Usual production requirements per acre for peanuts and cotton,  
by soil-suitability groups, Georgia-Alabama peanut area

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	870	620	390	---	---	---
Hay	"	860	640	440	---	---	---
Lint	"	---	---	---	245	180	120
Seed	"	---	---	---	430	324	216
Production requirements:							
Seed	"	65	65	65	40	40	40
Fertilizer	"	120	120	120	300	300	300
Side dressing	"	---	---	---	75	75	75
Bags	Number	10	7	5	---	---	---
Labor:							
Pre-harvest man labor	Man hour	30	30	30	45	45	45
Harvest man labor	" "	31	28	25	<u>1/</u>	<u>1/</u>	<u>1/</u>
Mule labor	Mule hour	43	43	43	42	42	42

1/ Expressed in table 15 as a custom rate.

Appendix table 6.- Usual production requirements per acre for runner peanuts and cotton, by soil-suitability groups, southeastern Coastal Plain area, Ga.

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	900	655	390			
Hay	"	1,000	700	500			
Lint	"				230	185	110
Seed	"				390	310	185
Production requirements:							
Seed	"	45	45	45	32	32	32
Fertilizer	"	280	280	280	300	300	300
Side dressing	"				50	50	50
Bags	Number	10.0	7.1	4.3			
Labor:							
Pre-harvest man labor	Man hour	19.4	19.4	19.4	37	37	37
Harvest man labor	" "	36.0	30.0	26.0	<u>1/</u>	<u>1/</u>	<u>1/</u>
Mule labor		36.5	36.5	36.5	34	34	34

1/ Expressed in table 19 as a custom rate.

Appendix table 7.- Usual production requirements per acre for peanuts and cotton by soil-suitability groups, Northeast Texas Sandy Lands

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	670	455	270			
Hay	"	1,200	900	600			
Lint	"				200	175	100
Seed	"				330	290	164
Production requirements:							
Seed	"	50	50	50	45	45	45
Bags	Number	11.0	7.5	4.5			
Labor:							
Pre-harvest man labor	Man hour	26.4	26.4	26.4	38	38	38
Harvest man labor	" "	30.0	26.0	23.0	<u>1/</u>	<u>1/</u>	<u>1/</u>
Mule labor	Mule hour	35.0	35.0	35.0	35	35	35

1/ Expressed in table 24 as a custom rate.

Appendix table 8.- Usual production requirements per acre for peanuts and cotton, by soil-suitability groups, Oklahoma Cross Timbers

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	720	530	290			
Hay	"	1,200	960	600			
Lint	"				200	150	125
Seed	"				360	270	224
Production requirements:							
Seed	"	52	52	52	40	40	40
Bags	Number	12.0	8.8	4.8			
Labor:							
Pre-harvest man labor	Man hour	23.5	23.5	23.5	29	29	29
Harvest man labor	" "	32	28	24	1/	1/	1/
Mule labor	Mule hour	42	42	42	34	34	34

1/ Expressed in table 28 as a custom rate.

Appendix table 9.- Usual production requirements per acre for peanuts and cotton, by soil-suitability groups, West Cross Timbers, Texas

Item	Unit	Peanuts			Cotton		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
Yield of product:							
Nuts	Pound	585	470	275			
Hay	"	720	660	600			
Lint	"				105	90	75
Seed	"				164	140	120
Production requirements:							
Seed	Pound	45	45	45	16	16	16
Bags	Number	9.8	7.8	4.6			
Labor:							
Pre-harvest man labor	Man hour	8	8	8	11	11	11
Harvest man labor	" "	9	8	7	1/	1/	1/
Mule labor	Mule hour	3.3	3.3	3.3	---	---	---
Tractor use	Tract. "	4.2	4.2	4.2	4.4	4.4	4.4

1/ Expressed in table 32 as a custom rate.

Appendix table 10.- Usual production requirements per acre for peanuts and grain sorghums by soil-suitability groups, Rio Grande Plain area, Texas

Item	Unit	Peanuts			Grain sorghums		
		Quantity per acre			Quantity per acre		
		Excel-	Good	Fair	Excel-	Good	Fair
		lent	soils	soils	lent	soils	soils
		soils	soils	soils	soils	soils	soils
Yield of product:							
Nuts	Pound	555	420	260			
Hay	"	1,000	800	600			
Grain	"				1,000	1,100	500
Production requirements:							
Seed	Pound	50	50	50	8	8	8
Bags	Number	6.3	4.7	2.9	10	11	5
Labor:							
Pre-harvest man labor	Man hour	11.5	11.5	11.5	4.6	4.6	4.6
Harvest man labor	" "	10	9	8	2	2	2
Tractor use	Tract. "	6.4	6.4	6.4	5.6	5.6	5.6





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